

**APPENDIX VII**  
**ACUTE TOXICITY TEST RESULTS**

**Volume II**

**Evaluation of the Effects of AFFF Inputs on the  
VIP Biological Nutrient Removal Process and Pass-Through Toxicity**

**PHASE 1A**

**Submitted to:**

**Naval Research Laboratory**

**DISTRIBUTION STATEMENT A**

**Approved for public release;  
Distribution Unlimited**

**DTIC QUALITY INSPECTED 2**

**Civil and Environmental Engineering Department  
Old Dominion University  
October 1997**

**Project No. N00014-96-1-G021**

**19971124 072**

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-018	
<p>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.</p>				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE October, 1997		3. REPORT TYPE AND DATES COVERED Phase IA Study, Sept. 1996 - Sept 1997
4. TITLE AND SUBTITLE Evaluation of the Effects of AFFF Inputs to the VIP Biological Nutrient Removal Process and Pass-through Toxicity <i>Vol. II</i>			5. FUNDING NUMBERS Grant No: N00014-96-1-G021 PR-Number: 61-2330-96 Disbursing Code: N68342 AGO Code: N66020 CAGE Code: 50075	
6. AUTHOR(S) Mujde Erten-Unal Gary C. Schafran				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Old Dominion University Department of Civil & Environmental Eng. KH 135, Norfolk, VA. 23529-0241			8. PERFORMING ORGANIZATION REPORT NUMBER  Project Number: 270351	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Naval Research Laboratory 4555 Overlook Avenue, SW Washington DC 20375-5326			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT  Approved for Public Release			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) <p>This report discusses the results of a bench scale study conducted to evaluate the potential inhibitory effects of untreated AFFF wastewater to the Virginia Initiative Plant (VIP) biological nutrient removal process. A bench-scale study was conducted to evaluate the potential inhibitory effects of untreated AFFF wastewater to the nitrification process of the Virginia Initiative Plant biological nutrient removal system. Under this testing, bench-scale reactors simulating the nitrification process were loaded at various AFFF concentrations and the influence on the process performance was evaluated. The purpose of this effort was to determine the level of AFFF that could be incorporated into the influent of a biological nutrient removal process without causing inhibitory effects. The results of the nitrification inhibition study showed that the AFFF concentrations tested in the range between 10 ppm to 60 ppm did not show any significant inhibition to biological nitrification. The effluent from each reactor did not exhibit any pass-through toxicity as well.</p>				
14. SUBJECT TERMS			15. NUMBER OF PAGES 185	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	

**APPENDIX VII**  
**ACUTE TOXICITY TEST RESULTS**

**ACUTE TOXICITY TEST RESULTS**

**10 ppm AFFF**

**MARCH 11, 1997**



March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 636

Sample ID: A-1

JRA ID: 97-2726

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Charlone  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-2726

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:32</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.59 - 8.05</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2726 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2726 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

_____
_____
_____
_____
_____

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-2726

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>17:05</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.58 - 8.03</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2726 Test Type&Organism: Acute (*Cyprinodon variegatus*)

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA # 97-2726 Test Type&Organism: Acute Cyprinodon variegatus

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/17/97  
Result (mg/L) 33  
QC Range (mg/L) 1 thru 36

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

---

---

---

---

---

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		



PWC# 636

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODUAddress ODU, Norfolk, VA

County \_\_\_\_\_

Pipe/Outfall/Location \_\_\_\_\_

NPDES# A-1, 8 Hr.

Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) H. YANG

Affiliation \_\_\_\_\_

Type of sample ☒ (Grab):Date 03/11/97Time 9 PM

\_\_\_\_\_(Composite):

From Date \_\_\_\_\_

Time \_\_\_\_\_

To Date \_\_\_\_\_

Time \_\_\_\_\_

Subsamples comprising composite:

Number A-1, 8 Hr.

Frequency of collection \_\_\_\_\_

Volume 2 LTemperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? No. If so, how? \_\_\_\_\_Permit with interim chlorine limit? No. If yes - limit (mg/L) \_\_\_\_\_Field pH 7.41

Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

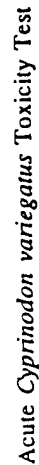
Method of shipment Reel

**Print & Sign Names**

1/ Relinquished by H. YANG Date 3-11-97 Time 9 P.M.Received by Kath Cufel Date 3-12-97 Time 09002. Relinquished by Kath Cufel Date 3-12-97 Time 0915 #636Received by Althea Miller Date 3/12/97 Time 0920Su PWC C-0-C

**FOR REED LAB USE ONLY**

JRA# 97-2726 Arrival Temperature 1.8°C On ice? yesColor light orange Odor earthy Solids nonepH 7.88 DO (mg/L) 9.0 Conductivity (umhos/cm) 1800 @ 20.1 °CSalinity (ppt) 1 TRC (mg/L) — Method —



## OBSERVATIONS

JRA# 97-2725

NPDES#: 21A

NPDES#: N/A  
ORGANISM SOURCE: ACS

**CLIENT:**

Deana - ODU

JRA BATCH#: C204

IIAT

OUTFALL: A-1  
HI DATE: 3/8/97

3

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



JRA# 97-2726

## OBSERVATIONS

Acute *Mysidopsis bahia* Toxicity Test

NPDES#: N/A

CLIENT: Oceana - OCU

JRA BATCH#: M451

OUTFALL: A1

3

HATCH DATE: 3/11/97 (500-0800)

Conc (%)		REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)				TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
	% Surv.		0	24	48	0	24	48	0	24	48	0	24	48	0	END
0		A	10	10	10	8.31	8.20	7.65	7.9	7.6	7.3	19.8	19.1	19.4	20	20
100		B	10	10	10											
6.25		A	10	10	10	8.29	8.17	7.62	8.0	7.6	7.2	19.9	19.1	19.4	20	20
100		B	10	10	10											
12.5		A	10	10	10	8.28	8.17	7.62	8.1	7.7	7.3	19.9	19.1	19.4	20	20
100		B	10	10	10											
25		A	10	10	10	8.26	8.15	7.61	8.3	7.6	7.4	20.0	19.1	19.4	20	20
100		B	10	10	10											
50		A	10	10	10	8.21	8.13	7.60	8.4	7.6	7.3	19.9	19.1	19.4	20	20
85		B	10	7	7											
100		A	10	10	10	8.03	8.05	7.59	9.1	7.7	7.3	19.7	19.1	19.4	20	20
100		B	10	10	10											

INIT	3/12	400	980
DATE 1997	3/12	3/13	3/14
TIME	175	1730	1632

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" C. variegatus "

## GENERAL COMMENTS

NPDES#: NIA CLIENT: Ocean ODUOUTFALL: A-1 <sup>3</sup>

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.7	8.03	✓	9.1	✓	1	20	✓	✓

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 3/12/97 Date 3/13 Date 3/13 Date 3/14  
 Method 1825 Method 0953 Method 1817 Method 1030  
 Minutes 053 Amount LOC Amount LOC Amount 053

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			053
CONT 61	1000	100	0	0/1000	NUMBER OF ORGANISMS	053		
6.25			62.5		STATISTICAL ANALYSES	NIA		
12.5			125					
25			250					
50			500					
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL  
 EQUIPMENT Make Model Serial Number Probe Number

pH meter Corning 245 5147  
 DO meter YSI 54ARC 14522  
 SCT meter YSI 33 4458  
 Temperature 053 VWR digi-thermo 745 QCI  
 Chlorine Fischer & Porter 821A009U23 8811A940230-1

COMMENTS:

March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 637

Sample ID: A-2

JRA ID: 97-2727

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Claiborne  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-2727

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:34</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.61 - 8.05</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2727 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 9.0</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2727 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/13/97

Result (mg/L) 0.09

QC Range (mg/L) 0.04 thru 0.24

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-2727

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>17:02</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.55 - 7.98</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2727 Test Type&Organism: Acute (*Cyprinodon variegatus*)

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.0</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2727 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/17/97  
Result (mg/L) 33  
QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

PWC# 637

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODU.Address ODU, Norfolk, VA.

County \_\_\_\_\_

Pipe/Outfall/Location \_\_\_\_\_

NPDES# A-2 8 Hr.

Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) M. YANG

Affiliation \_\_\_\_\_

Type of sample ✓ (Grab):Date 03/11/97Time 9 PM

(Composite): From Date \_\_\_\_\_

Time \_\_\_\_\_

To Date \_\_\_\_\_

Time \_\_\_\_\_

Subsamples comprising composite:

Number A-2, 8 Hr. Frequency of collection \_\_\_\_\_Volume 2 L.Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? No Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? No. If so, how? \_\_\_\_\_Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_Field pH 7.51

Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

Method of shipment Reel

**Print & Sign Names**

1. Relinquished by M. YANG Date 03/11/97 Time 9 PMReceived by Kath C. Lyle Date 3-12-97 Time 09002. Relinquished by Kath C. Lyle Date 3-12-97 Time 0915Received by Alexander Miller Date 3/12/97 Time 0920See PWC C-0-C

**FOR REED LAB USE ONLY**

JRA# 97-2727 Arrival Temperature 1.8°C On ice? YesColor tan Odor earthy Solids nonepH 8.08 DO (mg/L) 9.7 Conductivity (µmhos/cm) 1800 @ 12.8°CSalinity (ppt) 1 TRC (mg/L) - Method -



Acute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

JRA# 97-2727

NPDES#: N/A CLIENT: Ocean - OPU ORGANISM SOURCE: AOS JRA BATCH#: C204 HATCH DATE: 3/8/97

OUTFALL: A-2

Conc. % Surv.	HOURS	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	0	END
0	0	A	10	10	10	8.31	8.16	7.69	7.9	7.8	7.7	19.8	19.7	20	20
6.25	0	A	10	10	10	8.32	8.16	7.59	8.0	7.9	7.8	19.8	19.7	20	20
12.5	0	B	10	10	10	8.30	8.14	7.61	8.2	7.9	7.7	19.8	19.7	20	20
25	0	A	10	10	10	8.28	8.12	7.61	8.3	8.0	7.8	19.8	19.7	20	20
45	0	B	10	10	9	8.19	8.04	7.50	8.4	8.2	7.4	19.9	19.7	20	20
50	0	A	10	10	10	7.97	7.88	7.55	9.0	8.1	7.4	19.7	19.7	20	20
95	0	B	10	10	10										
100	0	A	10	10	10										
100	0	B	10	10	10										

INIT	953	105	108
DATE 19 97	3/12	3/13	3/14
TIME	1720	1655	1702

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

## OBSERVATIONS

### acute *Mysidopsis bahia* Toxicity Test

VPDES#: N/A

CLIENT: Deena - Du

QJ  
JRA BATCH#: M451

## HATC

OUTFALL: A-2

5

ORGANISM SOURCE: *Mesocricetus auratus* JRA BATCH#: M451 HATCH DATE: 3/11/97 1500-0800

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

NPDES#: N/A CLIENT: Ocean ODUOUTFALL: A-2

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 21:00	3/12/97	19.7	7.97	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/12 Date 3/13 Date 3/13 Date 3/14  
 Method 1825 Method 0953 Method 1817 Method 1030  
 Minutes 053 Amount LOG Amount LOG Amount 053

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			053
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	053		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250mL TYPE: Mysid VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147  
 DO meter YSI 54ARC 14522  
 SCT meter YSI 33 4458  
 Temperature 053 VWR digi-thermo 745 QCI  
 Chlorine Fischer & Porter 821A009U23 8811A940230-1

COMMENTS:



March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 638

Sample ID: A-3

JRA ID: 97-2728

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

*Carol Isenhour*  
*ja* Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-2728

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:35</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.62 - 8.01</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2728 Test Type&Organism: Acute Mysisidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.2 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2728 Test Type&Organism: Acute *Mysidopsis bahia*

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/13/97  
Result (mg/L) 0.09  
QC Range (mg/L) 0.04 thru 0.24

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-2728

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/12/97                      Time 17:20

Test End:                      Date 3/14/97                      Time 16:59

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 8.04</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2728 Test Type&Organism: Acute (Cyprinodon variegatus)

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2728 Test Type&Organism: Acute *Cyprinodon variegatus*

### TEST RESULTS (Continued)

#### 3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/17/97</u>	
Result (mg/L)		<u>33</u>	
QC Range (mg/L)		<u>1</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

#### 5. Protocol Deviations/Comments

---



---



---



---



---

## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		



**Toxicity Test Sample Chain of Custody**  
(Please complete all information)



Facility Dept. Civil & Environ. Eng. ODU  
Address ODU Norfolk, VA.

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# A-3 8Hr. Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) H. YANG Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 03/11/97 Time 9 PM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-3 8Hr Frequency of collection \_\_\_\_\_ Volume 2L

Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.54 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

Method of shipment Reel

**Print & Sign Names**

1. Relinquished by H. YANG Date 03/11/97 Time 9 PM

Received by Keith Cappel Date 3-12-97 Time 0900

2. Relinquished by Keith Cappel Date 3-12-97 Time 0915

Received by Althea Driller Date 3/12/97 Time 0920

#638

**FOR REED LAB USE ONLY**

JRA# 97-2728 Arrival Temperature 1.8°C On ice? yes

Color light yellow Odor earthy Solids none

pH 7.92 DO (mg/L) 8.6 Conductivity (µmhos/cm) 1800 @ 22.8°C

Salinity (ppt) 1 TRC (mg/L) — Method —

[illegible]



" C. variegatus "

## GENERAL COMMENTS

JRA# 77-2728NPDES#: N/A CLIENT: Oceana ODUOUTFALL: A-3 5

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/4/97 2100	3/12/97	19.7	7.98	/	9.1	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/12 Date 3/13 Date 3/13 Date 3/14  
 Method 1825 Method 0953 Method 1817 Method 1030  
 Minutes 053 Amount LOG Amount LOG Amount 053

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	40.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			053
6.25	1000	100	0	0/1000	NUMBER OF ORGANISMS	053		
12.5			125		STATISTICAL ANALYSES	N/A		
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250mL TYPE: Mystyfer VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	053
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Baxton VWR</u>	digi-thermo	<u>745 QCI</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



March 21, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 639

Sample ID: B-1

JRA ID: 97-2729

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Claisone  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-2729

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/12/97                      Time 17:25

Test End:                      3/14/97                      16:37

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age: 1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:    200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>2</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 7.98</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2729 Test Type&Organism: Acute Mysisidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.0</u>	<u>7.3 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		
Chlorine	<u>N/A</u>	
Salinity	<u>Forty Fathoms</u>	
pH	<u>N/A</u>	

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-2729 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147*	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-2729

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/12/97                      Time 17:20

Test End:                      Date 3/14/97                      Time 16:57

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>2</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.51 - 7.95</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2729 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.0</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-2729 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/17/97  
Result (mg/L) 33  
QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

PWC# 640639

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODU.Address ODU. Norfolk, VA

County \_\_\_\_\_

Pipe/Outfall/Location \_\_\_\_\_

NPDES# B-1, 8Hr.

Instream Waste Conc \_\_\_\_\_

Sample collected by (print&amp;sign) \_\_\_\_\_

Affiliation \_\_\_\_\_

Type of sample ☒ (Grab):Date 03/11/97Time 9 PM

\_\_\_\_\_(Composite): From Date \_\_\_\_\_

Time \_\_\_\_\_

To Date \_\_\_\_\_

Time \_\_\_\_\_

Subsamples comprising composite:

Number B-1, 8Hr Frequency of collection \_\_\_\_\_Volume 2LTemperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? \_\_\_\_\_Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_Field pH 7.61

Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

Method of shipment Reel

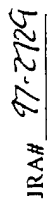
**Print & Sign Names**

1.	Relinquished by <u>H. YANG</u>	Date <u>03/11/97</u>	Time <u>9 PM</u>
	Received by <u>Keith Cangel</u>	Date <u>3-12-97</u>	Time <u>0900</u>
2.	Relinquished by <u>Keith Cangel</u>	Date <u>3-12-97</u>	Time <u>0915</u>
	Received by <u>Robert Miller</u>	Date <u>3-12-97</u>	Time <u>0920</u>

#639

**FOR REED LAB USE ONLY**

JRA# 97-2729 Arrival Temperature 18°C On ice? YColor light yellow Odor earthy Solids NORpH 7.73 DO (mg/L) 8.6 Conductivity (µmhos/cm) 1800 @ 21.3 °CSalinity (ppt) 2 TRC (mg/L) N/A Method \_\_\_\_\_



## OBSERVATIONS

### Acute *Cyprinodon variegatus* Toxicity Test

VPDES#: N/A

CLIENT: Deena - DM

IRA BATCH#: C204

OUTFALL: B-1  
HATCH DATE: 3/8/97

6

[illegible]

INIT	083	083	083		
DATE 19 97	3/12	3/13	3/14		
TIME	1720	1700	1657		

(Indicate comments with an \* and document on General Comments page.)

Rev 3/19/96



JRA# 97-2129

## OBSERVATIONS

cute *Mysidopsis bahia* Toxicity Test

IPDES#: N/A

CLIENT: Oregon - Ode

OUTFALL: B-1

ORGANISM SOURCE: Chesapeake (culture)

JRA BATCH#: M451

HATCH DATE: 3/11/97 1500 - 0800

Conc (%) % Surv.	HOURS →	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
0		A	0	24	48	0	24	48	0	24	48	0	24	0	END
100		B	10	10	10	8.31	8.20	7.45	7.9	7.6	7.3	19.8	19.1	20	20
6.25		A	10	10	10	8.29	8.14	7.64	8.1	7.6	7.3	19.9	19.1	20	20
100		B	10	10	10	8.26	8.13	7.63	8.2	7.7	7.3	19.9	19.1	20	20
12.5		A	10	4	8	8.22	8.11	7.61	8.3	7.7	7.2	20.0	19.1	20	20
85		B	10	9	9	8.17	8.08	7.57	8.5	7.6	7.2	20.0	19.1	20	20
25		A	10	10	10	7.90	7.98	7.56	9.0	7.7	7.3	19.6	19.1	20	20
100		B	10	10	10										
50		A	10	4	8										
85		B	10	9	9										
100		A	10	10	10										
100		B	10	10	10										

INIT	DB	WOC	DB
DATE 19 97	3/12	3/13	3/14
TIME	1725	1750	1837

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

## GENERAL COMMENTS

JRA# 77-2729NPDES#: N/A CLIENT: Oceana ODUOUTFALL: B-1 6

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.6	7.90	/	9.0	/	22	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/12 Date 3/13 Date 3/14 Date 3/12 3/13 3/14  
 Method 1825 Method 0953 Method 1817 Time 1030  
 Minutes 053 Amount 406 Amount 406 Init 053

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			053
Control	1000	100	0	0	NUMBER OF ORGANISMS	053		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 200 200  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature 053 VWR digi-thermo 1046303 TAS DC1 n/a  
 Chlorine Fischer & Porter 321A009U23 8811A940230-1 A

COMMENTS:



March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 640

Sample ID: B-2

JRA ID: 97-2730

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Charlene  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-2730

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   3/12/97                      17:25

Test End:                      3/14/97                      16:55

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age:    1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.61 - 8.03</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2730 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2730 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/13/97  
Result (mg/L) 0.09  
QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-2730

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>16:39</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 8.04</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.2 - 9.1</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2730 Test Type&Organism: Acute Cyprinodon variegatus

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/17/97  
Result (mg/L) 33  
QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		



PWC# 640

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility Dept. Civil & Environ. Eng. ODU.  
Address ODU. Norfolk, VA.

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# B-2, 8 Hr. Instream Waste Conc \_\_\_\_\_  
Sample collected by (print&sign) H. YANG Affiliation \_\_\_\_\_  
Type of sample ✓ (Grab): Date 03/11/97 Time 9 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number B-2 8 Hr. Frequency of collection \_\_\_\_\_ Volume 2L

Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.65 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

Method of shipment Reel

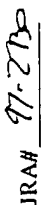
Print & Sign Names

1. Relinquished by H. YANG Date 03/11/97 Time 9 PM  
Received by Keith C. Felt Date 3-12-97 Time 0900  
2. Relinquished by Keith C. Felt Date 3-12-97 Time 0915  
Received by Arthur Miller Date 3/12/97 Time 0920

#640

FOR REED LAB USE ONLY

JRA# 97-2730 Arrival Temperature 1.8°C On ice? yes  
Color light yellow Odor earthy Solids none  
pH 7.82 DO (mg/L) 8.6 Conductivity (µmhos/cm) 1800 @ 25°C  
Salinity (ppt) 1 TRC (mg/L) 4.00 Method —  
N/A



## OBSERVATIONS

### Acute *Cyprinodon variegatus* Toxicity Test

NPDES#: N/A CLIENT: Oceana - Offu OUTFALL: B-2 7  
ORGANISM SOURCE: ABS JRA BATCH#: C204 HATCH DATE: 3/8/77

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



ute Mysidopsis bahia Toxicity Test

# OBSERVATIONS

JRA# 97-2730

PDES#: N/A

CLIENT: Oceana - OCU

OUTFALL: B-2 7

ORGANISM SOURCE: Chesapeake (culture)

JRA BATCH#: 1451

HATCH DATE: 3/11-12/97 500-0800

Conc (%)	REP ↓	HOURS→	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	8.31	8.20	7.65	7.9	7.6	7.3	19.8	19.1	19.4	20	20
100	B		10	10	10											
6.25	A		10	10	10	8.30	8.17	7.64	8.1	7.7	7.3	19.8	19.1	19.4	20	20
100	B		10	10	10											
12.5	A		10	10	10	8.28	8.16	7.63	8.2	7.8	7.2	19.8	19.1	19.4	20	20
100	B		10	10	10											
25	A		10	10	10	8.25	8.14	7.62	8.4	7.8	7.2	19.9	19.1	19.4	20	20
95	B		10	9	9											
50	A		10	10	10	8.20	8.12	7.62	8.6	7.6	7.1	19.9	19.1	19.4	20	20
100	B		10	10	10											
100	A		10	10	10	7.95	8.03	7.61	9.1	7.5	7.1	19.7	19.1	19.4	21	21
100	B		10	10	10											

INIT	105	106	105
DATE 19 97	3/12	3/13	3/14
TIME	1725	1405	1655

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

## GENERAL COMMENTS

JRA# 77-2730NPDES#: NIA CLIENT: Oceana ODUOUTFALL: B.2 7

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.7	7.95	/	9.1	/	1	21	/	/

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 3/12 Date 3/13 Date 3/13 Date 3/14  
 Method 1825 Method 0953 Method 1817 Method 1030  
 Minutes 053 Amount LOG Amount LOG Amount 053

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			053
Control	1000	100	0	0/1000	NUMBER OF ORGANISMS	053		
6.25			62.5		STATISTICAL ANALYSES	NIA		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250mL TYPE: Mystyfer VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT Make Model Serial Number Probe Number

pH meter Corning 245 5147 203 26

DO meter YSI 54ARC 14522 N

SCT meter YSI 33 4458 A

Temperature 053 VWR digi-thermo 1046303 7AS QCI n/a

Chlorine Fischer & Porter 821A009U23 8811A940230-1 A

COMMENTS:

March 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748  
Delivery Order: 0228-080  
J.O. #: 1912290  
Item No.: 0002BH, 0002BJ, 0003AD  
NPDES Permit #: N/A  
PWC #: 641  
Sample ID: B-3  
JRA ID: 97-2731

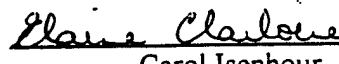

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
\_\_\_\_\_  
 Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-2731

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:51</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.55 - 8.08</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2731 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.6 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2731 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments




**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-2731

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/12/97                      Time 17:20

Test End:                      3/14/97                      16:44

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.52 - 8.06</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2731 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

### TEST RESULTS (Continued)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/17/97</u>	
Result (mg/L)		<u>33</u>	
QC Range (mg/L)		<u>1</u>	thru <u>36</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

---

---

---

---

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODUAddress ODU Norfolk VA

County \_\_\_\_\_

Pipe/Outfall/Location \_\_\_\_\_

NPDES# B-3 8 Hr.

Instream Waste Conc \_\_\_\_\_

Sample collected by (print&amp;sign) \_\_\_\_\_

H. YONG

Affiliation \_\_\_\_\_

Type of sample ☒ (Grab):Date 03/11/97Time 9 PM

\_\_\_\_\_(Composite):

From Date \_\_\_\_\_

Time \_\_\_\_\_

To Date \_\_\_\_\_

Time \_\_\_\_\_

Subsamples comprising composite:

Number B-3 8 Hr. Frequency of collection \_\_\_\_\_Volume 2 L.Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_

Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? No. If so, how? \_\_\_\_\_Permit with interim chlorine limit? No. If yes - limit (mg/L) \_\_\_\_\_Field pH 7.69

Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

Method of shipment Reel

**Print & Sign Names**

1. Relinquished by H. YONG Date 03/11/97 Time 9 PMReceived by Kath C. J.Date 3-12-97Time 09002. Relinquished by Kath C. J.Date 3-12-97Time 0915Received by Attles MillerDate 3/12/97Time 0920

#641

**FOR REED LAB USE ONLY**

JRA# 97-2731Arrival Temperature 1.8°COn ice? yesColor light yellowOdor earthySolids nonepH 7.91DO (mg/L) 8.6Conductivity (umhos/cm) 1800@ 21.2 °CSalinity (ppt) 1TRC (mg/L) -Method -



## OBSERVATIONS

JRA# 97-2731

NPDES#: 21A

CLIENT: *Deana - Odu*

OUTFALL: B-3 8

ORGANISM SOURCE: ABS

JRA BATCH#: C201

HATCH DATE: 3/8/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

Acute *Mysidopsis bahia* Toxicity Test

## OBSERVATIONS

JRA# 97-2734

NPDES#: N/A CLIENT: Oceana - Ocul OUTFALL: B-3 8  
ORGANISM SOURCE: Chesapeake (culture) JRA BATCH#: M451 HATCH DATE: 3/11-12/97 1500-0800

Conc (%) % Surv.	HOURS	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	END
0	A		10	10	10	8.31	8.20	7.65	7.9	7.6	7.3	19.8	19.1	19.4	20
100	B		10	10	10										
6.25	A		10	9	9	8.31	8.18	7.50	8.0	7.7	7.2	19.8	19.1	19.4	20
90	B		10	9	9										
12.5	A		10	10	10	8.30	8.18	7.51	8.1	7.7	7.0	19.9	19.1	19.4	20
100	B		10	10	10										
25	A		10	10	10	8.28	8.17	7.51	8.3	7.6	6.8	19.9	19.1	19.4	20
100	B		10	10	10										
50	A		10	9	9	8.21	8.15	7.53	8.5	7.4	6.7	20.0	19.1	19.4	20
95	B		10	10	10										
100	A		10	10	9	8.03	8.08	7.55	9.1	7.6	6.4	19.7	19.1	19.4	20
90	B		10	10	9										

INIT	033	106	033
DATE 19 97	3/12	3/13	3/14
TIME	1125	1300	1651

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

## GENERAL COMMENTS

JRA# 77-2731NPDES#: N/A CLIENT: Oceana ODUOUTFALL: B-3 8

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.7	8.03	/	9.1	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 3/12/97 Date 3/12/97 Date 3/12/97 Date 3/12 3/13 3/13 3/14  
 Method 1825 Method 0953 Method 1817 Time 1825 0953 1817 1030  
 Minutes 253 Amount LOG Amount LOG Init 253 LOG LOG 253

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	20.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			253
CONT 101	1000	100	0	0/1000	NUMBER OF ORGANISMS	253		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: 253								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	253
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Basin VWR</u>	digi-thermo	<u>1046203</u> <u>745 DC1</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 635

Sample ID: Mix L. R.R.

JRA ID: 97-2725

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Claiborne  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-2725

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:30</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.60 - 8.02</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2725 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2725 Test Type&Organism: Acute *Mysidopsis bahia*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-2725

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/12/97                      Time 17:20

Test End:                      3/14/97                      17:08

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus                      Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 8.01</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

## RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

## TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test Known Parentage? <u>N/A</u>	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2725 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/17/97

Result (mg/L) 33

QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mix L. R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		



PWC # 635

Toxicity Test Sample Chain of Custody  
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODUAddress ODU, Norfolk, VA

County \_\_\_\_\_

Pipe/Outfall/Location \_\_\_\_\_

NPDES# Mix L. RR

Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) H. YANG

Affiliation \_\_\_\_\_

Type of sample ✓ (Grab):Date 03/11/97Time 11 AM

\_\_\_\_\_(Composite):

From Date \_\_\_\_\_

Time \_\_\_\_\_

To Date \_\_\_\_\_

Time \_\_\_\_\_

Subsamples comprising composite:

Number Mix L. RR

Frequency of collection \_\_\_\_\_

Volume 2 L.Temperature of sample in sample collection device 28.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? \_\_\_\_\_Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_Field pH 7.25 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

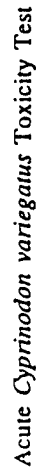
Method of shipment Reed

Print & Sign Names

1. Relinquished by H. YANG Date 03/11/97 Time 11 AM #635Received by Kath. Cuffel Date 3-12-97 Time 09002. Relinquished by Kath Cuffel Date 3-12-97 Time 0915Received by Catherine Miller Date 3/12/97 Time 0920See PWC C-0-C

FOR REED LAB USE ONLY

JRA# 97-2725 Arrival Temperature 1.8°C On ice? yesColor light yellow Odor earthy Solids nonepH 7.86 DO (mg/L) 9.0 Conductivity (µmhos/cm) 1800 @ 20.1°CSalinity (ppt) 1 TRC (mg/L) — Method —



## OBSERVATIONS

JIRA# 97-2725

NPDES#: N/A CLIENT: Oceana - Opu OUTFALL: Mix L. 2/22 2  
ORGANISM SOURCE: ABS JRA BATCH#: C204 HATCH DATE: 3/8/87

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



NPDES#: N/A CLIENT: Oceana - OCU OUTFALL: MIX L. 122 2  
ORGANISM SOURCE: Chesapeake (culture) JRA BATCH#: M451 HATCH DATE: 3/11/2017 1500-0800

[illegible]

" C. variegatus "

## GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: Mix L 2

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 11:00	3/12/97	19.6	8.01	✓	9.1	✓	1	20	✓	✓

DO Adj. \_\_\_\_\_ pH Adj. \_\_\_\_\_ TRC Adj. \_\_\_\_\_ Feedings (*Mysid*)

Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date 3/12 3/13 3/13 3/14 \_\_\_\_\_  
 Method \_\_\_\_\_ Method \_\_\_\_\_ Method \_\_\_\_\_ Time 1825 0953 1817 1030 \_\_\_\_\_  
 Minutes \_\_\_\_\_ Amount \_\_\_\_\_ Amount \_\_\_\_\_ Init DSB LOC LOC DSB \_\_\_\_\_

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	10.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			DSB
CONT 601	1000	100	0	0.1002 to 1000	NUMBER OF ORGANISMS	DSB		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: <u>DSB</u>								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Buxton VWR</u>	digit-thermo	<u>7A5 QCI</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS: \_\_\_\_\_

March 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 634

Sample ID: Feed S.

JRA ID: 97-2724

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Carlson  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-2724

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:51</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>All vessels from test initiation</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.47 - 7.49</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2724 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.1 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-2724 Test Type&Organism: Acute Mysidopsis bahia

### TEST RESULTS (Continued)

### 3. Statistical Results (as appropriate)

LC50 17.7%

Survival	(NOEC)	(LOEC)
----------	--------	--------

Normal Distribution (yes/no) \_\_\_\_\_

Homogeneous Variance (yes/no) \_\_\_\_\_

Growth or Reproduction	(NOEC)	(LOEC)
------------------------	--------	--------

Normal Distribution (yes/no) \_\_\_\_\_

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/13/97

Result (mg/L)	<u>0.09</u>
---------------	-------------

QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
---------------------	-------	-------	----------	----------

pH meter	Corning	245	5147	G
----------	---------	-----	------	---

DO meter	YSI	54ARC	14522	N
----------	-----	-------	-------	---

SCT meter	YSI	33	4458	A
-----------	-----	----	------	---

Temperature	VWR	digi-thermo	7A5 QC1	N/A
-------------	-----	-------------	---------	-----

Chlorine Fischer

& Porter 821A009423 8811A940230-1 A

### 5. Protocol Deviations/Comments

---

---

---

---

---



**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-2724

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>16:48</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>All vessels from test initiation</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.47 - 7.70</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2724 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.1 - 9.1</u>	<u>7.7 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		
Chlorine	<u>N/A</u>	
Salinity	<u>Forty Fathoms</u>	
pH	<u>N/A</u>	

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-2724 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>52%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/17/97</u>	
Result (mg/L)		<u>33</u>	
QC Range (mg/L)		<u>1</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		
2/28/97	Invalid	35		
3/12/97	17.7	52		

PWC#634

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility Dept. Civil & Environ. Eng. ODU

Address ODU Norfolk VA.

County \_\_\_\_\_

Pipe/Outfall/Location \_\_\_\_\_

NPDES# Feed S

Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) H. YANG

Affiliation \_\_\_\_\_

Type of sample ✓ (Grab):

Date 03/11/97

Time 11 AM

\_\_\_\_\_(Composite): From Date \_\_\_\_\_

Time \_\_\_\_\_

To Date \_\_\_\_\_

Time \_\_\_\_\_

Subsamples comprising composite:

Number Feed S

Frequency of collection \_\_\_\_\_

Volume 2 L

Temperature of sample in sample collection device 26.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_

Field pH 6.74

Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed \_\_\_\_\_

(Specify organisms) \_\_\_\_\_

Method of shipment \_\_\_\_\_

Print & Sign Names

1. Relinquished by H. YANG

Date 03/11/97

Time 11 AM

#634

Received by K. CARRANFIELD

Date 3-12-97

Time 0901

2. Relinquished by Keith C. Hill

Date 3-12-97

Time 0915

Received by Catherine Miller

Date 3/12/97

Time 0920

SEE PWC COC.

FOR REED LAB USE ONLY

JRA# 97-2724

Arrival Temperature 1.0°C

On ice? yes

Color light orange

Odor yeast

Solids none

pH 7.12

DO (mg/L) 9.8

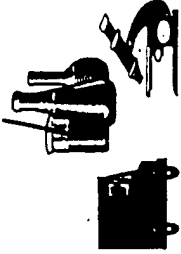
Conductivity (umhos/cm) 1600

@ 19.8°C

Salinity (ppt) 1

TRC (mg/L) -

Method -



# & ANALYSIS REQUEST FORM

COMPANY/COMMAND: Ocean CODE:   
CONTACT: Douglas Kirk  
PHONE: 433-3439 EXT:  FAX:   
J.O. #: 1912290  
SIGNATURE:   
PERMIT NO.:

## CLIENT INFORMATION

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO											pH	TEMPERATURE	OTHER
634	634	Feed S.	START	3/1/97	1100	G	HY	L	I	1	Biogassam	97-2724		682
635	635	Mix L. R.R.	START		1100							97-2725		
636	636	A-1	START		2100							97-2726		
637	637	A-2	START		2120							97-2727		
638	638	A-3	START		2120							97-2728		
639	639	B-1	START		2100							97-2729		
640	640	B-2	START		2100							97-2730		

TYPE	MATRIX	CONTAINER	PRESERVATIVE							
			1. COOL TO 4 C	2. HNO3 PH<2	3. H2SO4 PH<2	4. NaOH PH>12	5. HCL PH<2	6. 0.008% Na2S2O3 4 C	7. FIELD FILTER	8. NONE
G - GRAB	L - LIQUID	P - PLASTIC								
CF - COMPOSITE, FLOW	S - SOLID	GIL - GLASS								
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON								
	SS - SEMI SOLID	V - VOAC								

TURNAROUND (days): \_\_\_\_\_ (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS: \_\_\_\_\_

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

Arrival Temp. 1.8°C

REGULATION APPLIED:

RCRA ( ) HRSD ( )  
SDWA ( ) TSCA ( )  
CWA ( ) PHOTO ( )  
CAA ( ) OTHER ( )

SAMPLING/COLLECTION CHARGE: \$ \_\_\_\_\_

POSSIBLE SAMPLE HAZARDS: \_\_\_\_\_

COMMENTS: \_\_\_\_\_

D.O. NUMBER: \_\_\_\_\_ INIT.: \_\_\_\_\_  
CONTRACT LAB: \_\_\_\_\_ DATE: \_\_\_\_\_  
CONTRACT NO.(S): \_\_\_\_\_ OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \*  
\*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

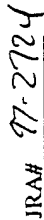
2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY: CHECK BOX INITIAL/FOXY

HOLDING TIME ( ) CONTAINERS ( ) INITIAL: \_\_\_\_\_ REJECTED ( ) REASON: \_\_\_\_\_

RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/1/97 0955  
RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/1/97 1035  
RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/1/97 1035  
RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/1/97 1035





## OBSERVATIONS

NPDES#: N/A CLIENT: Oceana - OBU OUTFALL: Feed S.  
ORGANISM SOURCE: AQS JRA BATCH#: C204 HATCH DATE: 3/8/97

\* low DO even with aq. at 0.7 ~ 100 bubbles/min.

Rev 3/19/96





Acute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-2724

NPDES#: N/A CLIENT: Oceana - Ocul OUTFALL: Feed S.  
ORGANISM SOURCE: Chesapeake (culture) JRA BATCH#: M451 HATCH DATE: 3/11-12/97 1500-0800

Conc (%)	REP ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)		SALINITY (19 - 21ppt)	
			0	24	0	24	0	24	0	24	0	END
0	A		10	10	8.31	8.20	7.9	7.6	19.8	19.7	20	20
100	B		10	10								
6.25	A		10	10	8.30	7.87	8.0	7.6	19.9	19.7	20	20
100	B		10	10								
12.5	A		10	10	8.27	7.85	8.1	7.4	19.9	19.7	20	20
90	B		10	10								
25	A		10	3	8.16	7.81	8.3	7.0	19.9	19.7	20	20
10	B		10	1								
50	A		10	0	8.01	7.55	8.5	0.1	20.0	19.7	20	20
0	B		10	0								
100	A		10	0	8.74	7.49	9.1	0.1	19.6	19.7	20	20
0	B		10	0								

Low DO even with aeration ~100 bubbles/min

INIT	100	100	100
DATE 19 97	3/12	3/13	3/14
TIME	176	1700	1651

(Indicate comments with an \* and document on General Comments page)

LC50 = 52.1

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 3/12/97 TEST NUMBER: 97-2724 DURATION: 48 hours  
TOXICANT : Feed S.  
SPECIES: C. variegatus

RAW DATA: Concentration	Number	Mortalities
----	Exposed	
.00	20	0
6.25	20	1
12.50	20	0
25.00	20	2
50.00	20	7
100.00	20	20

SPEARMAN-KARBER TRIM: 2.50%

SPEARMAN-KARBER ESTIMATES: LC50: 52.35  
95% LOWER CONFIDENCE: 43.49  
95% UPPER CONFIDENCE: 63.02

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.  
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

---

**ACUTE TOXICITY TEST RESULTS**

**30 ppm AFFF**

**MARCH 19, 1997**



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 670

Sample ID: A-1

JRA ID: 97-3154

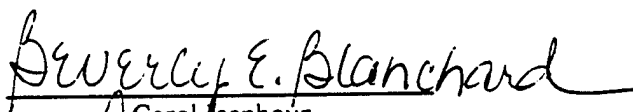
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
Carol Isenhour  
for Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3154

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/20/97                      Time 16:00

Test End:                      3/22/97                      15:54

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.12 - 8.13</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3154 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.8 - 8.6</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-3154 Test Type&Organism. Acute *Mysidopsis bahia*

### TEST RESULTS (Continued)

### 3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>                    </u>	(LOEC) <u>                    </u>
	Normal Distribution (yes/no)	<u>                    </u>	
	Homogeneous Variance (yes/no)	<u>                    </u>	
Growth or Reproduction	(NOEC)	<u>                    </u>	(LOEC) <u>                    </u>
	Normal Distribution (yes/no)	<u>                    </u>	
	Homogeneous Variance (yes/no)	<u>                    </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

#### 4. Equipment

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

### 5. Protocol Deviations/Comments

---

---

---

---

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3154

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:33</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.12 - 8.21</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3154 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.6</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3154 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/24/97

Result (mg/L) >40

QC Range (mg/L) 2 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENV. TAL ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241  
County        Pipe/Outfall/Location         
NPDES#        Instream Waste Conc         
Sample collected by (print&sign) yang Affiliation         
Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM  
       (Composite): From Date        Time         
To Date        Time       

Subsamples comprising composite:

Number A-1, 8 Hr. Frequency of collection        Volume 2 L.  
Temperature of sample in sample collection device 28.5°C.  
Final temperature of effluent at sample collection point         
Is sample collection device chilled?        Is sample packed on ice for shipment?         
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)  
Is the sample chlorinated? No dechlorinated?        If so, how?         
Permit with interim chlorine limit? No If yes - limit (mg/L)         
Field pH 7.50 Field Total Residual Chlorine         
Comments/Sample description A-1, 8 Hr.

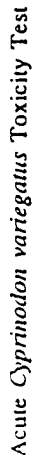
Type of test(s) to be performed ACUTE TOXICITY TESTING  
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP  
Method of shipment       

Print & Sign Names

1. Relinquished by yang Date 03/19/97 Time 20:00 PM  
Received by Douglas R. Kil Date 3-20-97 Time Noon  
2. Relinquished by Douglas R. Kil Date 3-20-97 Time 12:20  
Received by A. Charles Date 3/20/97 Time 1245

FOR REED LAB USE ONLY

JRA# 97-3154 Arrival Temperature 2.9 On ice? yes  
Color tan Odor earthy Solids none  
pH 6.88 DO (mg/L) 8.5 Conductivity (µmhos/cm) 1800 @ 19.5°C  
Salinity (ppt) 1 TRC (mg/L) — Method —



JRA# 97-3154

OUTFALL: A-1

HATCH DATE: 3/17/97

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



" *C. Variegatus* " " "

## GENERAL COMMENTS

JRA# 97-3154

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: A-1

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/29/97	0	3/19/97 2000	3/29/97	19.5	7.12	/	8.6	/	1	20	-	-

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22  
 Method 1630 Method 1205 Method 1730 Method 1020  
 Minutes 106 Amount 106 Amount 153 Amount 106

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/29/97	0	3/29/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	914.72 to 1000	NUMBER OF ORGANISMS	153		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: <u>153</u>								

TEST CHAMBER SIZE: 250 mL TYPE: Mysticore VOLUME OF TEST SOLUTION: 200 mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 200 26  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature 200 VWR 7AS DCI 200 7AS DCI 200 7AS DCI  
 Chlorine Fischer & Porter 321A009U23 3311A940230-1 A  
 COMMENTS:

March 31, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 668

Sample ID: A-2

JRA ID: 97-3152

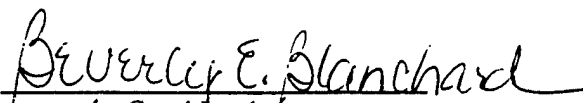
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
Carol Isenhour  
for Vice President

JRA/jsc



**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3152

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>15:58</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.96 - 8.22</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3152 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.9 - 8.6</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3152 Test Type&Organism: Acute Mysisidopsis bahia

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/24/97  
Result (mg/L) 0.09  
QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3152

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:35</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.96 - 8.20</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3152 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.6</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3152 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

_____
_____
_____
_____
_____

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENV'TAL ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241  
County        Pipe/Outfall/Location         
NPDES#        Instream Waste Conc         
Sample collected by (print&sign) yang Affiliation         
Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM  
       (Composite): From Date        Time         
To Date        Time       

Subsamples comprising composite:

Number A-2. 8Hr Frequency of collection        Volume 2L.  
Temperature of sample in sample collection device 28.5°C  
Final temperature of effluent at sample collection point         
Is sample collection device chilled?        Is sample packed on ice for shipment?         
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)  
Is the sample chlorinated? No dechlorinated?        If so, how?         
Permit with interim chlorine limit?        If yes - limit (mg/L)         
Field pH 7.54 Field Total Residual Chlorine         
Comments/Sample description A-2. 8Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING  
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP  
Method of shipment Reel

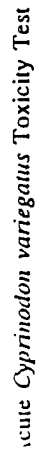
Print & Sign Names

1. Relinquished by yang Date 03/19/97 Time 20:00 PM  
Received by Dylan S. Kirk Date 3-20-97 Time Noon  
2. Relinquished by Dylan S. Kirk Date 3-20-97 Time 12:20  
Received by Q. Dinsdale Date 3/20/97 Time 1245

FOR REED LAB USE ONLY

JRA# 97-3152 Arrival Temperature 2.9 On ice? yes  
Color tan Odor earthy Solids none  
pH 6.69 DO (mg/L) 8.6 Conductivity (µmhos/cm) 1800 @ 19.6°C  
Salinity (ppt) 1 TRC (mg/L) - Method -





## OBSERVATIONS

JRA# 97-3152

#Sched  
2/5

CLIENT: Decm9 - Old

**CLIENT:**

Q/A  
JIRA BATCH#: C205

OUTFALL: A-2  
WATCH DATE: 3/17/97

ORGANISM SOURCE:

Ans

[illegible]

(Indicate comments with an \* and document on General Comments page.)

Rev 3/19/96



## OBSERVATIONS

JRA# 97-3152

PPES#:  
N/A

CLIENT: Ocean - Oil

PPDS#: N/A CLIENT:   
ORGANISM SOURCE: Chesapeake Cultures

OUTFALL: A-2

HATCH DATE: 3/5-20/97 1500. 0800

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. Variegatus* " " "

## GENERAL COMMENTS

JRA# 97-3152

NPDES#: N/ACLIENT: Oceana ODUOUTFALL: A-2

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/20/97	0	3/19/97 2000	3/20/97	19.6	6.96	/	8.6	/	1	20	—	—

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22  
 Method 1430 Method 1705 Method 1730 Method 1020  
 Minutes Amount Amount Init LDC LDC DS LDC

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/20/97	0	3/20/97	19.7	<u>DS</u> 7.70	7.9	20	12.91

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			<u>DS</u>
Control	1000	100	0	214.28 To 1000	NUMBER OF ORGANISMS	<u>DS</u>		
6.25			62.5		STATISTICAL ANALYSES	<u>N/A</u>		
12.5			125					
25			250					
50			500	✓				
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: <u>DS</u>								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Comine	245	5147	<u>DS</u> <u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>DS</u> <u>Banion VWR</u>	digi-thermo	<u>DS</u> <u>7A5 DC1</u>	N/A
Chlorine	Fischer & Porter	321A009U23	9811A940230-1	A

COMMENTS:

March 31, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 667

Sample ID: A-3

JRA ID: 97-3151

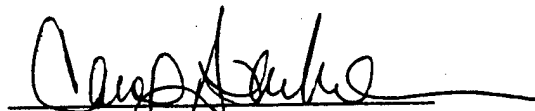
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-3151

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>16:01</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.90 - 8.11</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3151 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.6</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3151 Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/24/97

Result (mg/L) 0.09

QC Range (mg/L) 0.04 thru 0.24

4. Equipment (Make Model Serial # Probe #)

pH meter Corning 245 5147 G

DO meter YSI 54ARC 14522 N

SCT meter YSI 33 4458 A

Temperature VWR digi-thermo 7A5 QC1 N/A

Chlorine Fischer & Porter 821A009423 8811A940230-1 A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-3151

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:38</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.90 - 8.18</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3151 Test Type&Organism: Acute Cyprinodon variegatus

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 8.6</u>	<u>7.5 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3151 Test Type&Organism: Acute Cyprinodon variegatus

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENVTL ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241

County        Pipe/Outfall/Location         
NPDES#        Instream Waste Conc       

Sample collected by (print&sign) yang Affiliation       

Type of sample ✓ (Grab): Date 3/19/97 Time 20:00 PM

       (Composite): From Date        Time       

To Date        Time       

Subsamples comprising composite:

Number A-3, 8 Hr. Frequency of collection        Volume 2L

Temperature of sample in sample collection device 28.5°C

Final temperature of effluent at sample collection point       

Is sample collection device chilled?        Is sample packed on ice for shipment?       

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated?        If so, how?       

Permit with interim chlorine limit? No If yes - limit (mg/L)       

Field pH 7.50 Field Total Residual Chlorine       

Comments/Sample description A-3, 8 Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING  
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reel

Print & Sign Names

- Relinquished by yang Date 03/19/97 Time 20:00 PM  
Received by [Signature] Date 3-20-97 Time Now
- Relinquished by [Signature] Date 3-20-97 Time 12:20  
Received by [Signature] Date 3/20/97 Time 12:45

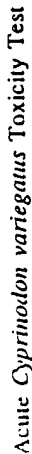
FOR REED LAB USE ONLY

JRA# 97-3151 Arrival Temperature 2.9 On ice? yes

Color tan Odor earthy Solids none

pH 6.64 DO (mg/L) 8.5 Conductivity (µmhos/cm) 1800 @ 19.7°C

Salinity (ppt) 1 TRC (mg/L) — Method —



JRA# 97-3151

## OBSERVATIONS

NPDES# 215

CLIENT: Deena - Odu

OUTFALL: A-3

IIATCH DATE: 3/17/97

JIRA BATCH#: C205

NPDES# 1  
ORGANISM SOURCE: ABS

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



## OBSERVATIONS

JRA# 97-3151

UPDATES: N/A

CLIENT: Deana - Da

**CLIENT:**

QJd JRA BATCH#: M453

OUTFALL:

A.3

WATCH DATE: 3/19-20/97 1500-0800

ORGANISM SOURCE: Chesapeake Cultures

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" C. Variegatus "

## GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana ODU OUTFALL: A-3

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/29/97	0	3/19/97 2000	3/29/97	19.7	6.90	/	8.6	/	1	20	-	-

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22  
 Method 1630 Method 1205 Method 1730 Method 1020  
 Minutes LOG Amount LOG Amount 153 Amount LOG

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/29/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			153
Control	1000	100	0	20 to 1000	NUMBER OF ORGANISMS	153		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: 153								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 226  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature Boxton VWR digit-thermo 745 GC1 N/A  
 Chlorine Fischer & Porter 321A009U23 3311A940220-1 A

COMMENTS: \_\_\_\_\_



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 664

Sample ID: B-1

JRA ID: 97-3148

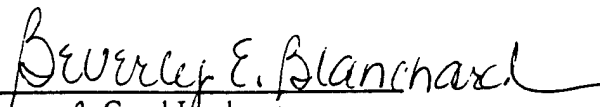
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
\_\_\_\_\_  
Carol Isenhour  
for Vice President

JRA/jsc



**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3148

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   3/20/97                      16:00

Test End:                      3/22/97                      16:02

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age:    1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.09</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3148 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.8 - 8.6</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>95</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3148 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3148

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:40</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.17</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3148 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 8.6</u>	<u>7.5 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

### TEST RESULTS (Continued)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>                    </u>	(LOEC) <u>                    </u>
	Normal Distribution (yes/no)	<u>                    </u>	
	Homogeneous Variance (yes/no)	<u>                    </u>	
Growth or Reproduction	(NOEC)	<u>                    </u>	(LOEC) <u>                    </u>
	Normal Distribution (yes/no)	<u>                    </u>	
	Homogeneous Variance (yes/no)	<u>                    </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u>	thru <u>36</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

---

---

---

---

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENV. TAL ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241

County        Pipe/Outfall/Location       

NPDES#        Instream Waste Conc       

Sample collected by (print&sign) yang Affiliation       

Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM

       (Composite): From Date        Time       

To Date        Time       

Subsamples comprising composite:

Number B-1, 8 Hr Frequency of collection        Volume 2L

Temperature of sample in sample collection device 28.5°C

Final temperature of effluent at sample collection point       

Is sample collection device chilled?        Is sample packed on ice for shipment?       

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated?        If so, how?       

Permit with interim chlorine limit? No If yes - limit (mg/L)       

Field pH 7.50 Field Total Residual Chlorine       

Comments/Sample description B-1, 8 Hr

Type of test(s) to be performed ACUTE TOXICITY TESTING

(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reel

Print & Sign Names

- Relinquished by yang Date 03/19/97 Time 20:00 PM  
Received by [Signature] Date 3-20-97 Time Now
- Relinquished by [Signature] Date 3-20-97 Time 12:20  
Received by [Signature] Date 3/20/97 Time 1245

FOR REED LAB USE ONLY

JRA# 97-3148 Arrival Temperature 2.9 On ice? yes

Color tan Odor earthy Solids none

pH 6.48 DO (mg/L) 8.5 Conductivity (umhos/cm) 1800 @ 19.8°C

Salinity (ppt) 1 TRC (mg/L) - Method -





Acute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

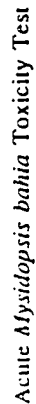
JRA# 97-3148

NPDES#: N/A CLIENT: Oceana - Odu OUTFALL: B-1  
ORGANISM SOURCE: ABS JRA BATCH#: C205 HATCH DATE: 3/17/97

Conc. % % Surv.	HOURS →	REP 	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)		SALINITY (19 - 21ppt)	
			0	24	48	72	96	120	144	168	192	END
0	A		10	10	10	10	10	10	10	10	10	10
100	B		10	10	10	10	10	10	10	10	10	10
6.25	A		10	10	10	10	10	10	10	10	10	10
100	B		10	10	10	10	10	10	10	10	10	10
12.5	A		10	10	10	10	10	10	10	10	10	10
100	B		10	10	10	10	10	10	10	10	10	10
25	A		10	10	10	10	10	10	10	10	10	10
100	B		10	10	10	10	10	10	10	10	10	10
50	A		10	10	10	10	10	10	10	10	10	10
100	B		10	10	10	10	10	10	10	10	10	10
100	A		10	10	10	10	10	10	10	10	10	10
100	B		10	10	10	10	10	10	10	10	10	10

INIT	DB	BB	YC
DATE 19 97	3/20	3/21	3/22
TIME	1550	1724	1940

(Indicate comments with an \* and document on General Comments page)



## OBSERVATIONS

JRAH 97-3148

NPDES# N/A

CLIENT: Ocean - Old  
Cultus JRA B

**CLIENT:**

Ocean - Du

OUTFALL: 6.1

ORGANISM SOURCE: *Chrysosporium*

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. Variegatus* "

## GENERAL COMMENTS

JRA# 97-3148

NPDES#: N/A CLIENT: Oceana ODU OUTFALL: B-1

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/24/97	0	3/19/97 2000	3/24/97	19.8	6.89	✓	8.6	✓	1	20	—	—

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22  
 Method 1630 Method 1205 Method 1730 Method 1020  
 Minutes LO6 Amount LO6 Amount 153 Amount LO6

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/24/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	214.72 To 1000	NUMBER OF ORGANISMS	BS		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: BS								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Bascom VWR</u>	digii-thermo	<u>745 QCI</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 665

Sample ID: B-2

JRA ID: 97-3149

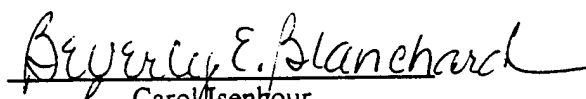
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3149

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/20/97                      Time 16:00

Test End:                      3/22/97                      16:05

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age: 1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:    200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.17</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3149 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.8 - 8.9</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3149 Test Type&Organism: Acute Mysisidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3149

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:43</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.11</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3149 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.0 - 8.9</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3149 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENV. TAL ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241  
County        Pipe/Outfall/Location         
NPDES#        Instream Waste Conc         
Sample collected by (print&sign) yang Affiliation         
Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM  
       (Composite): From Date        Time         
To Date        Time       

Subsamples comprising composite:

Number B-2, 8 Hr. Frequency of collection        Volume 2L.  
Temperature of sample in sample collection device 28.5C  
Final temperature of effluent at sample collection point         
Is sample collection device chilled?        Is sample packed on ice for shipment?         
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)  
Is the sample chlorinated? No dechlorinated?        If so, how?         
Permit with interim chlorine limit? No If yes - limit (mg/L)         
Field pH 7.47 Field Total Residual Chlorine         
Comments/Sample description B-2 8 Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING  
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP  
Method of shipment Reel

Print & Sign Names

1. Relinquished by yang Date 03/19/97 Time 20:00 PM  
Received by Douglas S. Kirk Date 3-20-97 Time None  
2. Relinquished by Douglas S. Kirk Date 3-20-97 Time 12:20  
Received by A. Crisp Date 3/20/97 Time 1245

FOR REED LAB USE ONLY

JRA# 97-3149 Arrival Temperature 2.9 On ice? yes  
Color tan Odor earthy Solids none  
pH 6.47 DO (mg/L) 8.9 Conductivity (µmhos/cm) 1800 @ 12.8°C  
Salinity (ppt) 1 TRC (mg/L) — Method —



## OBSERVATIONS

JRA# 97-349

NPDES# 215

CLIENT: Decara - Oda

OUTFALL: B.2.

ORGANISM SOURCE: AgS

JURA BATCH#: 6705

MEETING DATE: 3/17/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



JRA# 97-3149

## OBSERVATIONS

acute *Mysidopsis bahia* Toxicity Test

TEST# N/A CLIENT: Ocean - OOI OUTFALL: B-2  
ORGANISM SOURCE: Chesapeake Culture JRA BATCH#: M453 HATCH DATE: 3/18-20/97 1500-0800

Conc. (%) % Surv.	REP U	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
		0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	10	10	10	7.70	8.27	8.30	7.9	7.0	8.5	19.7	20.4	20.5	20	20
100	B	10	10	10											
6.25	A	10	10	10	7.49	8.30	8.27	8.0	7.8	8.4	19.8	20.4	20.5	20	20
100	B	10	10	10											
12.5	A	10	10	10	7.32	8.30	8.26	8.1	7.7	8.4	19.8	20.4	20.5	20	20
100	B	10	10	10											
25	A	10	10	10	7.21	8.28	8.25	8.1	7.7	8.2	19.8	20.4	20.5	20	20
100	B	10	10	10											
50	A	10	10	10	7.02	8.21	8.21	8.3	7.6	7.6	19.9	20.4	20.5	20	20
100	B	10	10	10											
100	A	10	10	10	6.89	8.10	8.17	8.9	7.8	8.6	19.8	20.4	20.5	20	20
100	B	10	10	10											

INIT	106	103	106
DATE 1997	3/20	3/21	3/22
TIME	1600	1707	1605

(Indicate comments with an \* and document on General Comments page)

REV 3/19/96

" C. Variegatus "

## GENERAL COMMENTS

JRA# 97-3149

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: B-2

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/20/97	0	3/19/97 2000	3/20/97	19.8	6.89	/	8.9	/	1	20	-	-

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22  
 Method 1630 Method 1205 Method 1730 Method 1020  
 Minutes Amount Amount Init LOG LOG DS LOG

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/20/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			DS
Control	1000	100	0	21.72 to 1000	NUMBER OF ORGANISMS	DS		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: DS								

TEST CHAMBER SIZE: 250 mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200 mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 @DS 26  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature @DS VWR digi-thermo @DS 745 GC1 n/a  
 Chlorine Fischer & Porter 821A0091J23 8811A940230-1 A

COMMENTS:



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 671

Sample ID: B-3

JRA ID: 97-3155

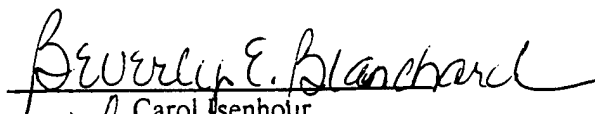
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
Carol Jensenhour  
Vice President

JRA/jsc



**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3155

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>16:09</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.88 - 8.11</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3155 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.7</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3155 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)           

Normal Distribution (yes/no)           

Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/24/97

Result (mg/L) 0.09

QC Range (mg/L) 0.04 thru 0.24

4. Equipment (Make Model Serial # Probe #)

pH meter Corning 245 5147 G

DO meter YSI 54ARC 14522 N

SCT meter YSI 33 4458 A

Temperature VWR digi-thermo 7A5 QC1 N/A

Chlorine Fischer & Porter 821A009423 8811A940230-1 A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3155

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:45</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.88 - 8.19</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3155 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 8.7</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3155 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QCI	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENV. TAL ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241  
County        Pipe/Outfall/Location         
NPDES#        Instream Waste Conc         
Sample collected by (print&sign) yang Affiliation         
Type of sample ☒ (Grab): Date 3/19/97 Time 20:00PM  
       (Composite): From Date        Time         
To Date        Time       

Subsamples comprising composite:

Number B-3, 8Hr. Frequency of collection        Volume 2L.  
Temperature of sample in sample collection device 28.5°C  
Final temperature of effluent at sample collection point         
Is sample collection device chilled?        Is sample packed on ice for shipment?         
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)  
Is the sample chlorinated? No dechlorinated?        If so, how?         
Permit with interim chlorine limit? No If yes - limit (mg/L)         
Field pH 7.44 Field Total Residual Chlorine         
Comments/Sample description B-3, 8Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING  
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP  
Method of shipment Reel

Print & Sign Names

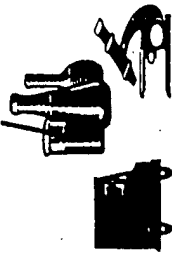
1. Relinquished by yang Date 03/19/97 Time 20:00 PM  
Received by D. Taylor & K. K. Date 3-20-97 Time         
2. Relinquished by D. Taylor & K. K. Date 3-20-97 Time 12:20  
Received by A. Taylor Date 3/20/97 Time 1245

FOR REED LAB USE-ONLY

JRA# 97-3155 Arrival Temperature 2.9 On ice? yes  
Color tan Odor earthy Solids none  
pH 6.49 DO (mg/L) 8.8 Conductivity (umhos/cm) 1800 @ 19.8°C  
Salinity (ppt) 1 TRC (mg/L) — Method



# CHAIN-OF-CUSTODY RECORD



**& ANALYSIS REQUEST FORM**  
 PWC ENVIRONMENTAL LABORATORY  
 CODE 930 BLDG Z-140  
 9742 MARYLAND AVENUE  
 NORFOLK, VA 23511 - 3095  
 PH: (757)445-8851 FAX: (757)445-8852

**CLIENT INFORMATION**

COMPANY/COMMAND: NAS OCEANA CODE:  
 CONTACT: KIRK, DOUGLAS  
 PHONE: EXT: FAX:  
 J.O. #: 1912290  
 SIGNATURE: SV FUG  
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN START STOP	ON DATE	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
										pH	TEMPERATURE	
664	B-1, 8 HL ODU	START 3/14/20-0 STOP	3/14/20-0	6	Yang	L	8	1	BIOASSAY		97-3148	
665	B-2, 8 HL ODU	START 20-00 STOP	20-00								97-3149	
666	MIX L.F.L	START 20-00 STOP	20-00								97-3150	
667	A-3 8 HL ODU	START 20-00 STOP	20-00								97-3151	
668	ODU - A-28 HL	START 20-00 STOP	20-00								97-3152	
669	FEEDS ODU	START 3/14/20-0 STOP	3/14/20-0								97-3153	
670	A-1, 8 HL ODU	START 3/14/20-0 STOP	3/14/20-0								97-3154	

**TYPE** **MATRIX** **CONTAINER** **PRESERVATIVE**

G - GRAB **LIQUID** **B BAG** **COOL TO 4 C** **HCL pH-2**  
 CF - COMPOSITE FLOW **GLASS** **C CARTRIDGE** **2 - HNO3 pH-2** **6 - 0.008% Na2S2O3 4 C**  
 CT - COMPOSITE TIME **TEFLON** **TEFLON LINED LID** **3 - H2SO4 pH-2** **7 - FIELD FILTER**  
**SS - SEMI SOLID** **HEXANE RINSED** **4 - NaOH pH-12** **8 - NONE**

**TURNAROUND (Days):** (FOR RUSH TURNAROUND STATE REASON BELOW)

**COMMENTS:**

**REGULATION APPLIED:**  
 RCRA ( ) HRSD ( )  
 SDWA ( ) TSCA ( )  
 CWA ( ) PHOTO ( )  
 CAA ( ) OTHER ( )

**Arrival Temp.** 3.2°C

**SAMPLE DISPOSAL:** ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

**1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \***  
 \*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

**2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).**


**FOR LAB USE ONLY** **CHECKBOX INITIALS FOR** **SAMPLES VERIFICATION**

**HOLDING TIME ( )** **CONTAINERS ( )** **INITIAL:** **REJECTED ( )** **REASON:**

**RELINQUISHED BY:** Q. O'Connell **REC'D BY:** SV FUG **COMPANY/COMMAND:** NAVY **DATE/TIME:** 3/20/20 1345  
**RELINQUISHED BY:** SV FUG **REC'D BY:** SV FUG **COMPANY/COMMAND:** NAVY **DATE/TIME:** 3/20/20 1345  
**RELINQUISHED BY:** SV FUG **REC'D BY:** SV FUG **COMPANY/COMMAND:** NAVY **DATE/TIME:** 3/20/20 1345  
**RELINQUISHED BY:** SV FUG **REC'D BY:** SV FUG **COMPANY/COMMAND:** NAVY **DATE/TIME:** 3/20/20 1345

# CHAIN-OF-CUSTODY RECORD

# CLIENT INFORMATION



**PWC ENVIRONMENTAL LABORATORY**  
**CODE 930 BLDG Z-140**  
**9742 MARYLAND AVENUE**  
**NORFOLK, VA 23511 - 3095**  
**PH: (757)445-8851 FAX: (757)445-8852**

COMPANY/COMMAND: NAS Oceana CODE: \_\_\_\_\_  
CONTACT: Kirk Powell  
PHONE: \_\_\_\_\_ EXT: \_\_\_\_\_ FAX: \_\_\_\_\_  
J.O. #: 912290  
SIGNATURE: \_\_\_\_\_  
PERMIT NO.: \_\_\_\_\_

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO.											pH	TEMPERATURE	
B002381	671	B-3 S-HR	START	3/9/73		G	YARB	L	8	1	BIO-A-GAY		97-3155	
B002382		ODG	STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											

TYPE	MATRIX	SW	WPE	P	PLASTIC	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID				B - BAG	1 - COOL TO 4 C	5 - HCL pH<2
CF - COMPOSITE FLOW	S - SOLID				G - GLASS	2 - HNO <sub>3</sub> pH<2	6 - 0.008% Na <sub>2</sub> SO <sub>3</sub> 4 C
CT - COMPOSITE TIME	GS - GAS				T - TEFLON	3 - H <sub>2</sub> SO <sub>4</sub> pH<2	7 - FIELD FILTER
	SS - SEMI SOLID				V - VOA	4 - NaOH pH<12	8 - NONE

TURNAROUND (DAY):	(FOR RUSH TURNAROUND STATE REASON BELOW)
COMMENTS:	

REGULATION APPLIED:	
RCRA ( )	HRSD ( )
SDWA ( )	TSCA ( )
CWA ( )	PHOTO ( )
CAA ( )	OTHER ( )

SAMPLING/COLLECTION CHARGE:	\$
POSSIBLE SAMPLE HAZARDS:	
COMMENTS:	

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

**Arrival Temp.** 3,2°C

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \*

\*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

D.O. NUMBER:	INIT.:
CONTRACT LAB:	DATE:
CONTRACT NO. (S):	
OFFICIAL USE ONLY	

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).  
\*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM -- 3:30 PM).

FOR LAB USE ONLY - CHECKBOX INITIALS OKAY				SAMPLES VERIFICATION							
HOLDING TIME ( )		CONTAINERS ( )		INITIAL:		REJECTED ( )		REASON:		INITIAL:	
REINQUIRED BY:	<i>J. Amador</i>	REC'D BY:	<i>JK</i>	COMPANY/COMMAND:	<i>PUC</i>	<i>CA13</i>	DATE/TIME:	<i>3/20/7 12:50</i>			
REINQUIRED BY:		REC'D BY:	<i>John S. SA</i>	COMPANY/COMMAND:	<i>PAJ</i>		DATE/TIME:	<i>3/20/7 1:55</i>			
REINQUIRED BY:		REC'D BY:		COMPANY/COMMAND:			DATE/TIME:				
REINQUIRED BY:		REC'D BY:		COMPANY/COMMAND:			DATE/TIME:				



Acute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

JRA# 97-3155

NPDES#: N/A

CLIENT: Ocean - Opa

OUTFALL: B-3

ORGANISM SOURCE: ABS

JRA BATCH#: C205

HATCH DATE: 3/17/97

Conc. % % Surv.	HOURS	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	0	24	0	24	48	0	END
0	0	A	10	10	10	7.70	8.28	7.9	24	127	193	195	20	20
100	0	B	10	10	10									
6.25	0	A	10	10	10	7.48	8.20	8.0	7.2	198	193	195	20	20
90	0	B	10	10	10									
12.5	0	A	10	10	10	7.32	8.20	8.1	7.1	198	193	195	20	20
45	0	B	10	10	10									
25	0	A	10	10	10	7.21	8.24	8.1	7.0	199	193	195	20	20
100	0	B	10	10	10									
50	0	A	10	10	10	7.08	8.20	8.2	7.0	199	193	195	20	20
100	0	B	10	10	10									
100	0	A	10	10	10	6.88	8.10	8.7	5.1	198	193	195	20	20
45	0	B	10	10	10									

\* pH probe malfunctioning - replaced

INIT	083	087	087	046
DATE 19 97	3/20	087	3/21	3/22
TIME	1550	1729	1717	1545

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



JRA# 97-3155

## OBSERVATIONS

cute *Mysidopsis bahia* Toxicity Test

IPDES#: N/A CLIENT: Ocean - OJA OUTFALL: B.3  
ORGANISM SOURCE: Chesapeake Culture JRA BATCH#: M453 HATCH DATE: 3/15/97 1500-0800

Conc (%) % Surv.	REP ↓	HOURS →	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	7.70	8.27	8.30	19.7	20.4	20.5	20	20
100	B		10	10	10				19.8	20.4	20.5	20	20
6.25	A		10	10	10	7.48	8.26	8.10	19.8	20.4	20.5	20	20
100	B		10	10	10				19.8	20.4	20.5	20	20
12.5	A		10	9	9	7.32	8.24	8.10	19.9	20.4	20.5	20	20
70	B		10	10	9	7.21	8.21	8.08	19.9	20.4	20.5	20	20
25	A		10	9	9	7.08	8.18	8.11	19.9	20.4	20.5	20	20
90	B		10	10	9				19.9	20.4	20.5	20	20
50	A		10	9	9	6.88	8.10	8.11	19.8	20.4	20.5	20	20
80	B		10	9	7								
100	A		10	10	9								
90	B		10	9	9								
INIT			100	100	100								
DATE 1997			3/20	3/21	3/22								
TIME			1600	1709	1609								

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" C. Variegatus " "

## GENERAL COMMENTS

JRA# 97-3155

NPDES#: N/A CLIENT: Oceana OduOUTFALL: B.3

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/29/97	0	3/19/97 2000	3/29/97	19.8	6.88	/	8.7	/	1	20	—	—

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22  
 Method 1630 Method 1205 Method 1730 Method 1020  
 Minutes LOC Amount LOC Amount ND Amount LOC

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/29/97	0	3/29/97	19.7	7.70	7.9-	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			<u>BS</u>
Control	1000	100	0	214.72 To 1000	NUMBER OF ORGANISMS	<u>BS</u>		
6.25			62.5		STATISTICAL ANALYSES	<u>N/A</u>		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: <u>BS</u>								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>2003 26</u>
DO meter	YSI	54ARC	14522	<u>N</u>
SCT meter	YSI	33	4458	<u>A</u>
Temperature	<u>VWR</u>	digit-thermo	<u>745 GC1</u>	<u>N/A</u>
Chlorine	Fischer & Porter	821A0091/23	8811A940230-1	<u>A</u>

COMMENTS:



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 669

Sample ID: Feed S.

JRA ID: 97-3153

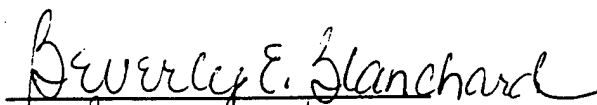
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3153

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/20/97                      Time 16:00

Test End:                        3/22/97                      15:49

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age: 1 day

Test Chamber Size:          250 mL

Volume of Test Solution per Chamber:    200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    All vessels from test initiation

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.73</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3153 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.2 - 8.8</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: Spearman-Karber  
Growth/Reproduction: N/A



JRA #: 97-3153 Test Type&Organism: Acute *Mysidopsis bahia*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>19.5%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3153

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:30</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>All vessels from test initiation</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.73 - 8.34</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3153 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>2.1 - 8.8</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>Spearman-Karber</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3153 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>35%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		
2/28/97	Invalid	35		
3/12/97	17.7	52		
3/20/97	19.5	35		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENV. TAL ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241

County        Pipe/Outfall/Location         
NPDES#        Instream Waste Conc       

Sample collected by (print&sign) Yang Affiliation       

Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM

☐ (Composite): From Date        Time       

To Date        Time       

Subsamples comprising composite:

Number Feed S Frequency of collection        Volume 2 L

Temperature of sample in sample collection device 26.0°C

Final temperature of effluent at sample collection point       

Is sample collection device chilled?        Is sample packed on ice for shipment?       

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated?        If so, how?       

Permit with interim chlorine limit? No If yes - limit (mg/L)       

Field pH 6.72 Field Total Residual Chlorine       

Comments/Sample description Feed S

Type of test(s) to be performed ACUTE TOXICITY TESTING  
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reel

Print & Sign Names

1.	Relinquished by <u>Yang</u>	Date <u>03/19/97</u>	Time <u>12:00 PM</u>
	Received by <u>[Signature]</u>	Date <u>3-20-97</u>	Time <u>Noon</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>3-20-97</u>	Time <u>12:20</u>
	Received by <u>[Signature]</u>	Date <u>3/20/97</u>	Time <u>12:45</u>

FOR REED LAB USE ONLY

JRA# 97-3153 Arrival Temperature 2.9 On ice? yes  
Color tan Odor yes Solids none  
pH 6.55 DO (mg/L) 8.9 Conductivity (µmhos/cm) 1600 @ 19.3 °C  
Salinity (ppt) 1 TRC (mg/L) — Method —

## OBSERVATIONS

JRA# 97-3153

VPDES#: 715

CLIENT: Deena - Odu

OUTFALL: Feed S

ORGANISM SOURCE: ABS

JRA BATCH#: C205

HATCH DATE: 3/17/87

Conc. %	REP ↓	HOURS →	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)	DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)		SALINITY (19 - 21ppt)	
			0	24 48		0	24 48	0	24 48	0	END
0	A		10	10 10	7.70	8.28	4.8	7.5	19.7	19.3	20
100	B		10	10 10	7.68	4.98	8.20	7.5	19.7	19.3	20
6.25	A		10	10 10	7.59	5.08	8.29	7.5	19.6	19.3	20
100	B		10	10 10	7.42	4.98	8.06	7.1	19.6	19.3	20
12.5	A		10	10 10	7.10	4.88	8.06	5.9	19.5	19.3	20
100	B		10	10 10	6.73	4.88	8.31	2.1	19.3	19.3	20
25	A		10	10 10							
45	B		10	10 10							
50	A		10	10 10							
5	B		10	10 10							
100	A		10	10 10							
0	B		10	10 10							

\* pH probe malfunctioning - replaced

INIT	DATE 19 97	TIME
D83	3/20	1550
L06	3/21	1610
LX6	3/22	1530

LC50=35%

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 3/20/97 TEST NUMBER: 97-3153 DURATION: 48 hours  
TOXICANT : Feed S.  
SPECIES: C. variegatus

RAW DATA: Concentration --- ---- (%)	Number Exposed	Mortalities
.00	20	0
6.25	20	0
12.50	20	0
25.00	20	1
50.00	20	19
100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 35.36  
95% LOWER CONFIDENCE: 32.13  
95% UPPER CONFIDENCE: 38.90

---





ute *Mysidopsis bahia* Toxicity Test

# OBSERVATIONS

JRA# 97-3153

PDES#: N/A CLIENT: Ocean - OOI OUTFALL: Feed S  
ORGANISM SOURCE: Chesapeake Cultures JRA BATCH#: M453 HATCH DATE: 3/19/97 1500-0800

Cunc (%) % Surv.	REP ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	7.70	8.27	8.30	7.9	7.0	8.5	19.7	20.4	20.5	20	20
100	B		10	10	10											
6.25	A		10	9	9	7.68	5.12	8.10	8.0	7.1	8.1	19.7	20.4	20.5	20	20
40	B		10	10	9											
12.5	A		10	9	8	7.59	5.08	8.26	8.0	7.2	7.9	19.6	20.4	20.5	20	20
80	B		10	9	8											
25	A		10	9	7	7.42	5.17	8.30	8.1	7.4	7.9	19.6	20.4	20.5	20	20
35	B		10	9	7											
50	A		10	0	0	7.10	4.79	-	8.3	0.4	-	19.5	20.4	20.5	20	20
0	B		10	0	0											
100	A		10	0	0	6.73	4.81	-	8.8	0.2	-	19.3	20.4	20.5	20	20
0	B		10	0	0		END									

\* pH probe malfunctioning - replaced

INIT	7:20	7:21	7:22
DATE 1997	LOG	LOG	LOG
TIME	1600	1555	1549

(Indicate comments with an \* and document on General Comments page)

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

LC50 = 19.5%

DATE: 3/20/97  
TOXICANT : Feed S.  
SPECIES: M. bahia

TEST NUMBER: 97-3153

DURATION: 48 hours

RAW DATA: Concentration ----- (%)	Number Exposed	Mortalities
.00	20	0
6.25	20	2
12.50	20	4
25.00	20	13
50.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: 10.00%

SPEARMAN-KARBER ESTIMATES: LC50: 19.52  
95% LOWER CONFIDENCE: 15.31  
95% UPPER CONFIDENCE: 24.88

---

Acute *Mysidopsis bahia* Toxicity Test" *C. Variegatus* " " "

## GENERAL COMMENTS

JRA# 97-3153

NPDES#: N/A CLIENT: Oceana ODU OUTFALL: Feds

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/24/97	0	3/19/97 2000	3/24/97	19.3	6.73	/	8.8	/	1	20	-	-

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

1997  
 Date 3/20 Date 3/21 Date 3/21 Date 3/22  
 Method 1630 Method 1205 Method 1730 Method 1020  
 Minutes Amount Amount Init 106 106 100 106

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/24/97	0	3/20/97	19.7	7.70	7.9	20	40.21

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	900	NUMBER OF ORGANISMS	BS		
6.25			62.5		STATISTICAL ANALYSES	BS		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: BS								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	BS
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	BS VWR	diei-thermo	745 GC1	N/A

Chlorine Fischer & Porter 821A009U23 3811A940230-1  
 COMMENTS: maintain pump shut off over night for 25% rep. A.

March 31, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 666

Sample ID: Mix L. R.R.

JRA ID: 97-3150

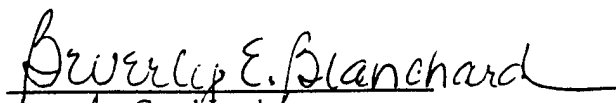
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3150

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>15:52</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.27 - 8.22</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3150 Test Type&Organism: Acute Mysisidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 9.0</u>	<u>7.0 - 8.5</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3150 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3150

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/20/97                      Time 15:50

Test End:                      3/22/97                      15:32

Test Type (chronic/acute):    Acute

Test Organism:                Cyprinodon variegatus                      Age: 3 days

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.27 - 8.16</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3150 Test Type&Organism: Acute (Cyprinodon variegatus)

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3150 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mix L. R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address CIVIL & ENV. TAL. ENG. DEPT.  
KDH 135 NORFOLK VA 23529-0241

County ✓ Pipe/Outfall/Location ✓  
NPDES# ✓ Instream Waste Conc ✓

Sample collected by (print & sign) yang Affiliation ✓

Type of sample ✓ (Grab): Date 3/19/97 Time 20:00 PM

(Composite): From Date ✓ Time ✓

To Date ✓ Time ✓

Subsamples comprising composite:

Number Mix. L. RR Frequency of collection ✓ Volume 2L

Temperature of sample in sample collection device 23.0°C

Final temperature of effluent at sample collection point ✓

Is sample collection device chilled? ✓ Is sample packed on ice for shipment? ✓

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? ✓ If so, how? ✓

Permit with interim chlorine limit? No If yes - limit (mg/L) ✓

Field pH 7.51 Field Total Residual Chlorine ✓

Comments/Sample description Mix L. RR

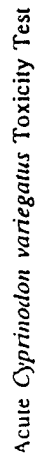
Type of test(s) to be performed ACUTE TOXICITY TESTING  
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP  
Method of shipment Reed

Print & Sign Names

1. Relinquished by yang Date 03/19/97 Time 20:12 PM  
Received by D. Taylor & Keith Date 3-20-97 Time Noon  
2. Relinquished by D. Taylor & Keith Date 3-20-97 Time 12:20  
Received by A. Angeles Date 3/22/97 Time 1245  
Re PWC Co

FOR REED LAB USE ONLY

JRA# 97-3150 Arrival Temperature 29 On ice? ✓  
Color tan Odor earthy Solids none  
pH 6.94 DO (mg/L) 9.0 Conductivity (µmhos/cm) 1900 @ 19.7°C  
Salinity (ppt) 1 TRC (mg/L) ✓ Method ✓



## OBSERVATIONS

JRA# 97-3150

#S1000N  
2/5

CLIENT: Ocean - Odu

OUTFALL: Mix L

ORGANISM SOURCE: ABS

JIRA BATCH#: C205

HATCH DATE: 3/2/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



ate *Mysidopsis bahia* Toxicity Test

# OBSERVATIONS

IRA# 97-350

PDES#: N/A CLIENT: Ocean - Oda OUTFALL: MIX L.  
ORGANISM SOURCE: Chesapeake Cultures IRA BATCH#: 17453 HATCH DATE: 3/19-20/97 1500-0800

Conc (%) % Surv.	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
		0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	10	10	10	7.70	8.27	8.30	7.9	7.0	8.5	19.7	20.4	20.5	20	20
100	B	10	10	10	7.68	8.23	8.30	8.0	7.7	8.6	19.8	20.4	20.5	20	20
6.25	A	10	10	10	7.62	8.24	8.31	8.1	7.7	8.6	19.8	20.4	20.5	20	20
100	B	10	10	10	7.51	8.23	8.31	8.2	7.0	8.6	19.8	20.4	20.5	20	20
12.5	A	10	10	10	7.43	8.21	8.29	8.4	7.0	8.6	19.9	20.4	20.5	20	20
100	B	10	10	10	7.27	8.11	8.22	9.0	8.9	8.4	19.7	20.4	20.5	21	21
100	A	10	10	10											
100	B	10	10	10											
100	A	10	10	10											
100	B	10	10	10											
INIT		106	183	106											
DATE 1997		3/20	3/21	3/22											
TIME		1600	1653	1552											

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. Variegatus* "

## GENERAL COMMENTS

JRA# 97-3150



NPDES#: N/A

CLIENT: Oceana ODU

OUTFALL: Mix L

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/20/97	0	3/19/97 2000	3/20/97	19.7	7.27	/	9.0	/	1	21	-	-

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date 3/20 3/21 3/21 3/22  
 Method \_\_\_\_\_ Method \_\_\_\_\_ Method \_\_\_\_\_ Time 1630 1705 1730 1020  
 Minutes \_\_\_\_\_ Amount \_\_\_\_\_ Amount \_\_\_\_\_ Init L06 L06 053 L06

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/20/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			053
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	053		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250 mL

TYPE: polystyrene

VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	003 226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	003 VWR	003 digi-thermo	003 745 QC1	n/a
Chlorine	Fischer & Porter	821A0091U23	8811A940230-1	A

COMMENTS:

**ACUTE TOXICITY TEST RESULTS**

**50 ppm AFFF**

**FEBRAURY 11, 1997**



February 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 576

Sample ID: A-1

JRA ID: 97-1622

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Charlone  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-1622

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 2/12/97                      Time 16:35

Test End:                      2/14/97                      15:45

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age:    4 days

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:    200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.00 - 8.10</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1622 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>5.0 - 8.3</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1622 Test Type&Organism: Acute *Mysidopsis bahia*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 2/11/97  
Result (mg/L) 0.15  
QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-1622

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:35</u>
Test End:	<u>2/14/97</u>	<u>16:52</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.10 - 8.13</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1622 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.3</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1622 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 2/18/97  
Result (mg/L) 27  
QC Range (mg/L) 0 thru 34

4. Equipment (Make Model Serial # Probe #)

pH meter Corning 245 5147 E

DO meter YSI 54ARC 14522 N

SCT meter YSI 33 4458 A

Temperature VWR digi-thermo 7A5 QC1 N/A  
Chlorine Fischer  
& Porter 821A009423 8811A940230-1 A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		



# CHAIN-OF-CUSTODY RECORD

## & ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

## CLIENT INFORMATION

COMPANY/COMMAND: DEANNA NAGAS

CONTACT: DOUGLAS KIRK

PHONE: 733 3439 EXT:      FAX:     

J.O. #: 191224C

SIGNATURE:     

PERMIT NO.:     

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES /CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER
571	B-3	START STOP	2/1/97 2/1/97	0700 PM	G	HY	L	1	1	TRACILITE MB/EC	97-1617	4°C	4°C
572	B-2	START STOP	2/1/97 2/1/97	0700 PM							97-1618		
573	B-1	START STOP	2/1/97 2/1/97	0700 PM							97-1619		
574	A-3	START STOP	2/1/97 2/1/97	0700 PM							97-1620		
575	A-2	START STOP	2/1/97 2/1/97	0700 PM							97-1621		
576	A-1	START STOP	2/1/97 2/1/97	0700 PM							97-1622		
577	MIXED LY R.F.	START STOP	2/1/97 2/1/97	1100 PM	G	HY	L	1	1		97-1623		

TYPE	MATRIX		CONTAINER		PRESERVATIVE			
	L - LIQUID	S - SOLID	P - PLASTIC	B - BAG	A - AMBER (glass)	1 - COOL TO 4 C	5 - HCL, pH<2	
G - GRAB								
CF - COMPOSITE, FLOW								
CT - COMPOSITE, TIME								
	GS - GAS		GL - GLASS	C - CARTRIDGE		2 - HNO3, pH<2	6 - 0.008% Na2S2O3, 4 C	
	SS - SEMI SOLID		T - TEFLON	TL - TEFLON LINED LID		3 - H2SO4, pH<2	7 - FIELD FILTER	
			V - VOA	HH - HEXANE RINSED		4 - NaOH, pH>12	8 - NONE	

TURNAROUND (Days):      (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:     

SAMPLING/COLLECTION CHARGE: \$     

POSSIBLE SAMPLE HAZARDS:     

COMMENTS:     

REGULATION APPLIED:

RCRA ( ) HRSD ( )

SDWA ( ) TSCA ( )

CWA ( ) PHOTO ( )

CAA ( ) OTHER ( )

Arrival Temp. 2.6°C

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \* ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY:

HOLDING TIME ( )

CHECK BOX & INITIAL IF OKAY:

SAMPLES VERIFICATION:     

REJECTED ( )

REASON:     

INITIAL:     

DATE:     

DATE/TIME: 2/1/97 1330

DATE/TIME: 2/1/97 1405

DATE/TIME:     

DATE/TIME:     

COMPANY/COMMAND:     

COMPANY/COMMAND:     

COMPANY/COMMAND:     

COMPANY/COMMAND:

**CONTINUATION SHEET**

SHEET 7 OF 7

OF



**PWC ENVIRONMENTAL LABORATORY**

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

P.O.C.: Douglas Kirk  
COMMAND: OCEANA NAS

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES /CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO											pH	TEMPERATURE	
0052817	578	Feeds	START	3/1/97	11:20	G	HY	L	1	1	TOXICITY		97-1624	4248
0052818			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											

**COMMENTS:**

Arrival Temp. 20°C

D.O. NUMBER:	INIT:
--------------	-------

**CONTRACT LAB:**

DATE:

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).

2. SAMPLES RECEIVED AFTER 2:00 PM MON. – THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM – 3:30 PM).

••FOR LAB USE ONLY••

**CHECK BOY & INITIALS OKAY**

**SAMPIES VERIFICATION**

774  
10. 2  
11. 10  
12. 10  
13. 10  
14. 10  
15. 10  
16. 10  
17. 10  
18. 10  
19. 10  
20. 10  
21. 10  
22. 10  
23. 10  
24. 10  
25. 10  
26. 10  
27. 10  
28. 10  
29. 10  
30. 10  
31. 10  
32. 10  
33. 10  
34. 10  
35. 10  
36. 10  
37. 10  
38. 10  
39. 10  
40. 10  
41. 10  
42. 10  
43. 10  
44. 10  
45. 10  
46. 10  
47. 10  
48. 10  
49. 10  
50. 10  
51. 10  
52. 10  
53. 10  
54. 10  
55. 10  
56. 10  
57. 10  
58. 10  
59. 10  
60. 10  
61. 10  
62. 10  
63. 10  
64. 10  
65. 10  
66. 10  
67. 10  
68. 10  
69. 10  
70. 10  
71. 10  
72. 10  
73. 10  
74. 10  
75. 10  
76. 10  
77. 10  
78. 10  
79. 10  
80. 10  
81. 10  
82. 10  
83. 10  
84. 10  
85. 10  
86. 10  
87. 10  
88. 10  
89. 10  
90. 10  
91. 10  
92. 10  
93. 10  
94. 10  
95. 10  
96. 10  
97. 10  
98. 10  
99. 10  
100. 10

[illegible]

HOLDING TIME ( )

CONTAINERS ( )

# SAMPLES: VERIFICATION

DEACON.

100

RECEIVED

[illegible]

REJECT	
--------	--

REASON:

INITIAL:

RELINQUISHED BY:

REC'D  
K. Goodrich

\_\_\_\_\_

LAND: 655

E: 2/12/

RELINQUISHED BY:

ALL	REC'D
-----	-------

---

AND: CO.

3/2/2:3

RELINQUISHED BY:

REC'D

---

**AND:**

١٢١

#576

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 1:00 AM 2:00 PM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-1 2H Frequency of collection \_\_\_\_\_ Volume 2L

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point 22.0°C

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.40 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment by side

**Print & Sign Names**

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Kath Cifal</u>	Date <u>2-12-97</u>	Time <u>10:00 A.M.</u>
2.	Relinquished by <u>Kath Cifal</u>	Date <u>2-12-97</u>	Time <u>10:15 A.M.</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM.</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1:40 PM</u>

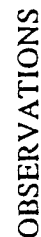
FOR REED LAB USE ONLY

JRA# 97-1622 Arrival Temperature 2.0°C On ice? yes

Color tan Odor earthy Solids none

pH 7.74 DO (mg/L) 7.8 Conductivity (umhos/cm) 1800 @ 19.9 °C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A



JRA# 97-1622

### Acute *Cyprinodon variegatus* Toxicity Test

$$\frac{5}{2}$$

CLIENT: Deena

only

OUTFALL: 6 A.1

NPDES#:                      PLA  
ORGANISM SOURCE: ABS

JRA BATCH#: C202

HIATCHI DATE: 2/6/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



Site *Mysidopsis bahia* Toxicity Test

# OBSERVATIONS

JRA# 97.1622

PDES#: N/A CLIENT: Oceana ODU OUTFALL: 6 A-1  
ORGANISM SOURCE: ABS JRA BATCH#: 1442 HATCH DATE: 2/8/97

Time (%)	REP	HOURS	NUMBER OF LIVE ORGANISMS (Control $\geq$ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) ( $>4.0$ , $<9.1$ @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	0	10	10	10	8.66	8.31	8.03	7.5	6.4	6.5	20.3	20.0	20.6	20	20
6.25	A	0	10	10	10	8.61	8.27	7.90	7.7	6.3	4.9	20.4	20.0	20.6	20	20
12.5	A	0	10	10	10	8.52	8.28	7.95	7.8	6.0	4.1	20.4	20.0	20.6	20	20
18.75	A	0	10	10	10	8.44	8.27	8.04	8.0	5.8	4.8	20.3	20.0	20.6	20	20
25	A	0	10	10	10	8.32	8.20	8.09	8.1	6.0	5.1	20.2	20.0	20.6	20	20
31.25	A	0	10	10	10	8.10	8.01	8.00	8.3	5.9	5.0	19.9	20.0	20.6	20	20
37.5	A	0	10	10	10											
43.75	A	0	10	10	10											
50	A	0	10	10	10											
56.25	A	0	10	10	10											
62.5	A	0	10	10	10											
68.75	A	0	10	10	10											
75	A	0	10	10	10											

INIT	0.3	10.0	0.3
DATE 1997	2/12	2/13	2/14
TIME	16:30	15:48	14:45

1545

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

NPDES#: N/A CLIENT: Oceana EDU OUTFALL: 6 A-1

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.9	8.0	8.3			1	20		

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

1997

Date 2/12 Date 2/13 Date 2/13 Date 2/14  
 Method 1718 Method 0850 Method 1645 Method 0859  
 Minutes 406 Amount 406 Amount 406 Amount 406

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			03
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	03		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: <u>03</u>								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>000 226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Baxton VWR</u>	digi-thermo	<u>745 QCI</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 575

Sample ID: A-2

JRA ID: 97-1621

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

*Elaine Clanton*  
*for* Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-1621

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:30</u>
Test End:	<u>2/14/97</u>	<u>15:42</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	:
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.01 - 8.14</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	



JRA #: 97-1621 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>4.7 - 8.2</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1621 Test Type&Organism: Acute Mysisidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 2/11/97  
Result (mg/L) 0.15  
QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-1621

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   2/12/97                      16:30

Test End:                      2/14/97                      16:45

Test Type (chronic/acute):    Acute

Test Organism:                Cyprinodon variegatus                Age:    6 days

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.12 - 8.15</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1621 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-1621 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

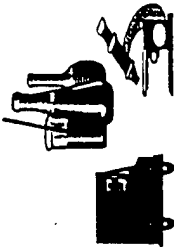
NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

# CHAIN-OF-CUSTODY RECORD



**& ANALYSIS REQUEST FORM**  
**PWC ENVIRONMENTAL LABORATORY**  
 CODE 930 BLDG Z-140  
 9742 MARYLAND AVENUE  
 NORFOLK, VA 23511 - 3095  
 ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852

## CLIENT INFORMATION

COMPANY/COMMAND: DELEAND AISCODE:  
 CONTACT: DOUGLAS K MC  
 PHONE: 733 3439 EXT: 1912290 FAX:   
 J.O. #: 1912290  
 SIGNATURE:   
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER
571	B-3	START STOP	2/16/97 0700 PM		G	HY	L	1	1	2.6°C	97-1617	4°C	
572	B-2	START STOP	2/16/97 0700 PM								97-1618		
573	B-1	START STOP	2/16/97 0700 PM								97-1619		
574	A-3	START STOP	2/16/97 0700 PM								97-1620		
575	A-2	START STOP	2/16/97 0700 PM								97-1621		
576	A-1	START STOP	2/16/97 0700 PM								97-1622		
577	MIXED B-2 R.C.	START STOP	2/16/97 1100 AM		G	HY	L	1	1		97-1623		

TYPE	MATRIX	L - LIQUID S - SOLID GS - GAS SS - SEMI SOLID	SW - SWIPE	CONTAINER	PRESERVATIVE
G - GRAB				P - PLASTIC GL - GLASS T - TEFLON V - VOA	1 - COOL TO 4 C 2 - HNO3, pH<2 3 - H2SO4, pH<2 4 - NaOH, pH>12 5 - HCL, pH<2 6 - 0.008% Na2S2O3, 4 C 7 - FIELD FILTER 8 - NONE

TURNAROUND (Days):  (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:

REGULATION APPLIED:

RCRA ( ) HRSD ( )  
 SDWA ( ) TSCA ( )  
 CWA ( ) PHOTO ( )  
 CAA ( ) OTHER ( )

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

Arrival Temp. 2.6°C MS

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).  
 \*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

SAMPLING/COLLECTION CHARGE: \$

POSSIBLE SAMPLE HAZARDS:

COMMENTS:

D.O. NUMBER: 227/067 INIT.:

CONTRACT LAB:  DATE:

CONTRACT NO.(S):  OFFICIAL USE ONLY

FOR LAB USE ONLY: CHECK BOX & INITIAL IF OKAY: SAMPLES VERIFICATION:  REJECTED ( ) INITIAL:

HOLDING TIME ( ) CONTAINERS ( )

RETURNSHIPPED BY: DOUGLAS K MC REC'D BY: DOUGLAS K MC COMPANY/COMMAND: DELEAND AISCODE DATE/TIME: 2/16/97 1330

RETURNSHIPPED BY: DOUGLAS K MC REC'D BY: DOUGLAS K MC COMPANY/COMMAND: DELEAND AISCODE DATE/TIME: 2/16/97 1405

RETURNSHIPPED BY: DOUGLAS K MC REC'D BY: DOUGLAS K MC COMPANY/COMMAND: DELEAND AISCODE DATE/TIME: 2/16/97 1405





#575

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-2 8 Hr. Frequency of collection \_\_\_\_\_ Volume \_\_\_\_\_

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.35 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment Dayside

**Print & Sign Names**

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Kith C. [Signature]</u>	Date <u>2-12-97</u>	Time <u>10:00 AM</u>
2.	Relinquished by <u>Kith C. [Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Received by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

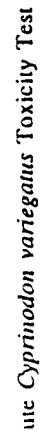
FOR REED LAB USE ONLY

JRA# 97-1621 Arrival Temperature 2.0°C On ice? YES

Color tan Odor earthy Solids none

pH 7.71 DO (mg/L) 7.7 Conductivity (umhos/cm) 1800 @ 19.9 °C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A



## OBSERVATIONS

JRA# 97-1621

2/1A

CLIENT: Deana

CDL

OUTFALL: 5 A-2

ORGANISM SOURCE: AgS

JURA BATCH#: C202

IIATCH DATE: 2/6/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



## OBSERVATIONS

JRA# 47-1621

21A

CLIENT: Diana Qu

OUTFALL: 5 A.2

ORGANISM SOURCE: ABS

JIRA BATCH#: 1/442

WATCH DATE: 2/8/97

[illegible]

INIT	DATE	TIME
083	2/12	630
LO6	2/13	1542
083	2/14	1542

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: 5A2

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L) >4;<9.1	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt) 19-21	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.9	8.14	/	8.2	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

1997

Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date 2/12 2/13 2/13 2/14 \_\_\_\_\_  
 Method \_\_\_\_\_ Method \_\_\_\_\_ Method \_\_\_\_\_ Time 1718 0850 1645 0857 \_\_\_\_\_  
 Minutes \_\_\_\_\_ Amount \_\_\_\_\_ Amount \_\_\_\_\_ Init LDC LDC LDC LDC \_\_\_\_\_

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

## TREATMENT PREPARATIONS CALCULATIONS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Volume to 1000
6.25			62.5	
12.5			125	
25			250	
50			500	
100			1000	0

CALCULATIONS PERFORMED BY: 083

VERIFICATION OF:

VERIFIED BY:

ANALYST SIGNATURES

INITIALS

TREATMENT PREPARATION CALCULATIONS

NUMBER OF ORGANISMS

STATISTICAL ANALYSES

083

083

N/A

083

TEST CHAMBER SIZE: 250mLTYPE: polystyreneVOLUME OF TEST SOLUTION: 200mL

## EQUIPMENT

Make

Model

Serial Number

Probe Number

pH meter

Corning

245

5147

083 226

DO meter

YSI

54ARC

14522

N

SCT meter

YSI

33

4458

A

Temperature

Duxton VWR

digi-thermo

083 745 QCI

N/A

Chlorine

Fischer &amp; Porter

821A009U23

8811A940230-1

A

COMMENTS:



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 574

Sample ID: A-3

JRA ID: 97-1620

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Carol Isenhour  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-1620

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:25</u>
Test End:	<u>2/14/97</u>	<u>15:40</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>8.03 - 8.10</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1620 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>4.6 - 8.2</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1620 Test Type&Organism: *Acute Mysidopsis bahia*

### TEST RESULTS (Continued)

### 3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>                    </u>	(LOEC) <u>                    </u>
Normal Distribution (yes/no)		<u>                    </u>	
Homogeneous Variance (yes/no)		<u>                    </u>	
Growth or Reproduction	(NOEC)	<u>                    </u>	(LOEC) <u>                    </u>
Normal Distribution (yes/no)		<u>                    </u>	
Homogeneous Variance (yes/no)		<u>                    </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		0.04	thru 0.24

#### 4. Equipment

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

### 5. Protocol Deviations/Comments

---

---

---

---



**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-1620

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   2/12/97                      16:25

Test End:                      2/14/97                      16:22

Test Type (chronic/acute):    Acute

Test Organism:                Cyprinodon variegatus                Age:    6 days

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>8.10 - 8.18</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1620 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1620 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

## CHAIN-OF-CUSTODY RECORD

## &amp; ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY  
 CODE 930 BLDG Z-140  
 9742 MARYLAND AVENUE  
 NORFOLK, VA 23511 - 3095  
 PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

PH: (757)445-8851 FAX: (757)445-8852

## CLIENT INFORMATION

COMPANY/COMMAND: DEANNA N. KIVK  
 CONTACT: Douglas Kivk  
 PHONE: 433-3439 EXT:      FAX:       
 J.O. #: 1912290  
 SIGNATURE:       
 PERMIT NO.:     

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN START STOP	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER
571	B-3	START 1/11/97 0700 STOP 1/11/97 0700	1/11/97	0700	G	HY	L	1	1	2011/11/11/97	97-1617	97-1618	4°C
572	B-2	START 1/11/97 0700 STOP 1/11/97 0700	1/11/97	0700	G	HY	L	1	1	2011/11/11/97	97-1617	97-1618	4°C
573	B-1	START 1/11/97 0700 STOP 1/11/97 0700	1/11/97	0700	G	HY	L	1	1	2011/11/11/97	97-1617	97-1618	4°C
574	A-3	START 1/11/97 0700 STOP 1/11/97 0700	1/11/97	0700	G	HY	L	1	1	2011/11/11/97	97-1617	97-1618	4°C
575	A-2	START 1/11/97 0700 STOP 1/11/97 0700	1/11/97	0700	G	HY	L	1	1	2011/11/11/97	97-1617	97-1618	4°C
576	A-1	START 1/11/97 0700 STOP 1/11/97 0700	1/11/97	0700	G	HY	L	1	1	2011/11/11/97	97-1617	97-1618	4°C
577	MIXED L & R	START 1/11/97 0700 STOP 1/11/97 0700	1/11/97	0700	G	HY	L	1	1	2011/11/11/97	97-1617	97-1618	4°C

TYPE	MATRIX	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC B - BAG	1 - COOL TO 4°C
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS C - CARTRIDGE	2 - HNO <sub>3</sub> pH<2
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON TL - TEFLON LINED LID	3 - H <sub>2</sub> SO <sub>4</sub> pH<2
	SS - SEMI SOLID	V - VOA	4 - NaOH pH>12
			5 - HCL pH<2
			6 - 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>
			7 - FIELD FILTER
			8 - NONE

TURNAROUND (DAYS): (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:

## REGULATION APPLIED:

RCRA ( ) HRSD ( )  
 SDWA ( ) TSCA ( )  
 CWA ( ) PHOTO ( )  
 CAA ( ) OTHER ( )

SAMPLING/COLLECTION CHARGE: \$

POSSIBLE SAMPLE HAZARDS:

COMMENTS:

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

Arrival Temp. 2.0°C

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \*

\*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

HOLDING TIME ( )	CHECK BOX & INITIAL IF OKAY	CONTAINERS ( )	INITIAL	REASON	REJECTED ( )	DATE/TIME
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>

DATE/TIME: 12/16/97  
 DATE/TIME: 12/16/97  
 DATE/TIME: 12/16/97  
 DATE/TIME: 12/16/97

## CHAIN-OF-CUSTODY RECORD

## &amp; ANALYSIS REQUEST FORM

CONTINUATION SHEET

SHEET 2 OF 2



PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852



ENVIRONMENTAL

P.O.C.: Douglas Kirk  
COMMAND: Oceana NAS

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO											PH	TEMPERATURE	
000317	578	Feeds	START	9/11/91	11:20	G	HY	L	1	1	TOXICITY	97.1/24	42.4	
000318			STOP		Am						MA + CV			
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											

Toxicity Test Sample Chain of Custody  
(Please complete all information)

#574



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_

NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 12:00 AM 7:00 PM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-3, B4 Frequency of collection \_\_\_\_\_ Volume \_\_\_\_\_

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point 22.0°C

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.35 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

Print & Sign Names

1. Relinquished by H. YANG Date 2/12/97 Time 9:00 AM

Received by Keith Cuthbert Date 2-12-97 Time 10:00

2. Relinquished by Keith Cuthbert Date 2-12-97 Time 10:15

Received by Keith Cuthbert Date 2-12-97 Time 10:15

Relinquished by Keith Cuthbert Date 2-12-97 Time 1405

Relinquished by Keith Cuthbert Date 2/12/97 Time 1405

FOR REED LAB USE ONLY

JRA# 97-1620 Arrival Temperature 2.0C On ice? yes

Color tan Odor earthy Solids none

pH 7.72 DO (mg/L) 7.8 Conductivity (umhos/cm) 1800 @ 17.7 °C

Salinity (ppt) 1 TRC (mg/L) NA Method N/A







## OBSERVATIONS

JRA# 77.1620

APDISH: N/A

CLIENT: Deana Qu

CLIENT: Deana Qu

OUTFALL: 4( A-3

OUTFALL: 4( A-3

ORGANISM SOURCE: ABS

JRA BATCH#: 1/142

WATCH DATE: 2/8/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

## GENERAL COMMENTS

JRA# 97-1620

NPDES#: N/A CLIENT: Oceana ODU OUTFALL: 4 A-3

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.7	8.10	/	8.2	/	1	21	/	/

DO Adj. pH Adj. TRC Adj. Feedings (mg/L)

Date 2/12/97 Date 2/13/97 Date 2/14/97  
 Method 1718 Method 0850 Method 1645 Method 0857  
 Minutes LDG Amount LDG Amount LDG Amount LDG

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			83
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	83		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: 83								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Cornine	245	5147	286
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	Baxter VWR	diei-thermo	745 DC1	N/A
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 573

Sample ID: B-1

JRA ID: 97-1619

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Cladine  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-1619

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	<u>Date</u> <u>2/12/97</u>	<u>Time</u> <u>16:20</u>
Test End:	<u>2/14/97</u>	<u>15:35</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.97 - 8.03</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1619 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.1 - 8.2</u>	<u>6.4 - 7.5</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1619 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 2/11/97  
Result (mg/L) 0.15  
QC Range (mg/L) 0.04 thru 0.24

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-1619

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:20</u>
Test End:	<u>2/14/97</u>	<u>16:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.02 - 8.08</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1619 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A



JRA #: 97-1619 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 2/18/97  
Result (mg/L) 27  
QC Range (mg/L) 0 thru 34

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

# CHAIN-OF-CUSTODY RECORD

## & ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY  
 CODE 930 BLDG Z-140  
 9742 MARYLAND AVENUE  
 NORFOLK, VA 23511 - 3095  
 ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852



## CLIENT INFORMATION

COMPANY/COMMAND: CLEAN AIR  
 CONTACT: DOUGLAS KIRK  
 PHONE: 757-343-39 EXT: 1912290  
 FAX: 1912290  
 J.O.#: 1912290  
 SIGNATURE: [Signature]  
 PERMIT NO.:

LAB USE ONLY	LINE ITEM #	SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS	PRESERVATION VERIFIED BY
	571	B-3		START	3/1/97	0700	G	HY	L	1	1		97-1617	4°C
	572	B-2		STOP	3/1/97	0700							97-1618	
	573	B-1		START	3/1/97	0700							97-1619	
	574	A-3		STOP	3/1/97	0700							97-1620	
	575	A-2		START	3/1/97	0700							97-1621	
	576	A-1		STOP	3/1/97	0700							97-1622	
	577	MIXED		START	3/1/97	1100	G	HY	L	1	1		97-1623	

TYPE	MATRIX	SW	SWIPE	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	B - BAG	A - AMBER (glass)	1 - COOL TO 4°C
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS	C - CARTRIDGE		2 - HNO <sub>3</sub> , pH<2
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON	TL - TEFLON LINED LID		3 - H <sub>2</sub> SO <sub>4</sub> , pH<2
	SS - SEMI SOLID	V - VOA	H - HEXANE RINSED		4 - NaOH, pH>12
					5 - HCL, pH<2
					6 - 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> , 4°C
					7 - FIELD FILTER
					8 - NONE

TURNAROUND (Days):  (FOR RUSH TURNAROUND STATE REASON BELOW)  
 COMMENTS:

REGULATION APPLIED:
RCRA ( ) HRSD ( )
SDWA ( ) TSCA ( )
CWA ( ) PHOTO ( )
CAA ( ) OTHER ( )

SAMPLING/COLLECTION CHARGE: \$   
 POSSIBLE SAMPLE HAZARDS:   
 COMMENTS:

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

Arrival Temp. 2.6°C

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).  
 \*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY	HOLDING TIME ( )	CONTAINERS ( )	INITIAL	REASON	REJECTED ( )	COMPANY/COMMAND	DATE/TIME
RETINQUISHED BY: <u>[Signature]</u>							
RETINQUISHED BY: <u>[Signature]</u>							
RETINQUISHED BY: <u>[Signature]</u>							

DATE/TIME: 3/1/97 1330  
 DATE/TIME: 3/1/97 1400  
 DATE/TIME:   
 DATE/TIME:

## CHAIN-OF-CUSTODY RECORD

## &amp; ANALYSIS REQUEST FORM



PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852



ENVIRONMENTAL

CONTINUATION SHEET

SHEET 2 OF 2

P.O.C.: Douglas Kirk  
COMMAND: Oceana NAS

LAB USE ONLY LINE ITEM #   SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
578	Feeds	START	9/11/20	Am	G	HY	L	1	1	TOXICITY	97.624	42.48	
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											

Toxicity Test Sample Chain of Custody  
(Please complete all information)

#573



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-1. 8H Frequency of collection \_\_\_\_\_ Volume \_\_\_\_\_

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.11 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By side

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:00 A.M.</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 A.M.</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Relinqu. by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Rel. by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-1619 Arrival Temperature 20°C On ice? yes

Color tan Odor earthy Solids none

pH 7.36 DO (mg/L) 7.8 Conductivity (umhos/cm) 1800 @ 19.7 °C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A

### Acute *Cyprinodon variegatus* Toxicity Test

## OBSERVATIONS

JRA# 97-1619

JPDES#: N/A

CLIENT: Deana

END

OUTFALL: 3 B (

ORGANISM SOURCE: ABS

JRA BATCH#: 002

HATCH DATE: 2/6/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



the *Mysidopsis bahia* Toxicity Test

# OBSERVATIONS

JRA# 97-169

PDES#: N/A CLIENT: Oceana JRA BATCH#: 1442 OUTFALL: 3 B-1  
ORGANISM SOURCE: ABS HATCH DATE: 2/8/97

Time (%) Surv.	HOURS	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)				TEMPERATURE (19 - 21°C)				SALINITY (19 - 21ppt)	
			0	24	48	72	0	24	48	72	0	24	48	72	0	END
	0	A	10	10	10	10	8.66	8.31	8.03		7.5	6.4	6.5		20	20
	100	B	10	10	10	10					20.3	20.0	20.6			
	6.25	A	10	10	10	10	8.62	8.30	7.99		7.7	6.9	5.4		20	20
	100	B	10	10	10	10					20.4	20.0	20.6			
	12.5	A	10	10	10	10	8.58	8.31	7.95		7.8	7.0	5.4		20	20
	100	B	10	10	10	10					20.4	20.0	20.6			
	25	A	10	10	10	10	8.45	8.25	7.84		7.9	6.4	3.9		20	20
	100	B	10	10	10	10					20.3	20.0	20.6			
	50	A	10	10	10	10	8.32	8.16	7.89		8.0	6.4	4.0		20	20
	100	B	10	10	10	10					20.2	20.0	20.6			
	100	A	10	10	10	10	8.02	8.03	7.97		8.2	6.8	6.1		20	20
	100	B	10	10	10	10					19.7	20.0	20.6			

INIT	08	100	153
DATE 1997	2/12	9/15	2/14
TIME	1620	1535	1535

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

NPDES#: NH CLIENT: OceanaOUTFALL: 3 B-1

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.7	8.02	/	8.2	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

1997

Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date 2/12 2/13 2/13 2/14

Method \_\_\_\_\_ Method \_\_\_\_\_ Method \_\_\_\_\_ Time 1718 0850 1645 0859

Minutes \_\_\_\_\_ Amount \_\_\_\_\_ Amount \_\_\_\_\_ Init LDC LDC LDC LDC

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

## TREATMENT PREPARATIONS CALCULATIONS

CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Volume to 1000
6.25	↓	↓	62.5	↓
12.5	↓	↓	125	↓
25	↓	↓	250	↓
50	↓	↓	500	↓
100	↓	↓	1000	0

VERIFICATION OF:

VERIFIED BY:

TREATMENT PREPARATION CALCULATIONS

NUMBER OF ORGANISMS

STATISTICAL ANALYSES

ANALYST SIGNATURES

INITIALS

CALCULATIONS PERFORMED BY: OSTEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>OS</u> <u>226</u> <u>(203)</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>OS</u> <u>Baxter VWR</u>	dici-thermo	<u>OS</u> <u>1046303</u> <u>7A5 DC1</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



February 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 572

Sample ID: B-2

JRA ID: 97-1618

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Charlone  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-1618

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:15</u>
Test End:	<u>2/14/97</u>	<u>15:25</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.87 - 7.96</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1618 Test Type&Organism: Acute Mysisidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.2 - 8.3</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1618 Test Type&Organism: Acute Mysisidopsis bahia

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 2/11/97  
Result (mg/L) 0.15  
QC Range (mg/L) 0.04 thru 0.24

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-1618

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 2/12/97                      Time 16:15

Test End:                      Date 2/14/97                      Time 16:10

Test Type (chronic/acute):      Acute

Test Organism:      Cyprinodon variegatus      Age: 6 days

Test Chamber Size:      250 mL

Volume of Test Solution per Chamber:      200 mL

Diluent:      20 ppt Forty Fathoms

Aeration Period (if necessary):      None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.87 - 8.02</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1618 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.3</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-1618 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

_____
_____
_____
_____
_____

## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		



# CHAIN-OF-CUSTODY RECORD

## & ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

## CLIENT INFORMATION

COMPANY/COMMAND: DEPT. OF ENVIRONMENTAL AGENCY

CONTACT: DEPT. OF ENVIRONMENTAL AGENCY

PHONE: 433-3439 EXT:        FAX:       

J.O. #: 191224C

SIGNATURE:       

PERMIT NO.:       

LAB USE ONLY LINE ITEM # / SAMPLE NO.	SAMPLE ID / LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START	2/1/97	0700	G	HY	L	1	1	20.00/10.00	97-1617	4°C	4°C
572	B-2	STOP	2/1/97	0700									
573	B-1	START	2/1/97	0700									
574	A-3	STOP	2/1/97	0700									
575	A-2	START	2/1/97	0700									
576	A-1	STOP	2/1/97	0700									
577	MIXED	START	2/1/97	1100	G	HY	L	1	1	20.00/10.00	97-1622	4°C	4°C

TYPE	MATRIX	SW - SWIPE	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	B - BAG	1 - COOL TO 4 C
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS	C - CARTRIDGE	5 - HCL, pH<2
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON	TL - TEFLON LINED LID	2 - HNO <sub>3</sub> , pH<2
	SS - SEMI SOLID	V - VOA	H - HEXANE RINSED	3 - H <sub>2</sub> SO <sub>4</sub> , pH<2
				4 - NaOH, pH>12
				5 - NONE

TURNAROUND (Days):        (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:       

SAMPLING/COLLECTION CHARGE: \$       

POSSIBLE SAMPLE HAZARDS:       

COMMENTS:       

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

Arrival Temp. 26°C

D.O. NUMBER: 227/067 INIT:       

CONTRACT LAB:        DATE:       

CONTRACT NO.(S):        OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \* ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY: CHECK BOX & INITIAL IF OKAY:        SAMPLES VERIFICATION:       

HOLDING TIME ( ) CONTAINERS ( ) INITIAL:        REASON:       

REINQUIRED BY:        RECD BY:        COMPANY/COMMAND:        DATE/TIME:       

REINQUIRED BY:        RECD BY:        COMPANY/COMMAND:        DATE/TIME:       

REINQUIRED BY:        RECD BY:        COMPANY/COMMAND:        DATE/TIME:

**FOR LAB USE ONLY**		CHECK BOX & INITIAL IF OKAY		SAMPLES: VERIFICATION			
HOLDING TIME ( )	CONTAINERS ( )	INITIAL:	REJECTED ( )	REASON:	INITIAL:		
RELINQUISHED BY: <i>Stephen Goodrich</i>	REC'D BY: <i>Stephen</i>			COMPANY/COMMAND: <i>665 Tac</i>		DATE/TIME: <i>2/12/86 1330</i>	
RELINQUISHED BY: <i>Stephen</i>	REC'D BY: <i>gt</i>			COMPANY/COMMAND: <i>602</i>		DATE/TIME: <i>2/12/87 1405</i>	
RELINQUISHED BY:	REC'D BY:			COMPANY/COMMAND:		DATE/TIME:	
RELINQUISHED BY:	REC'D BY:			COMPANY/COMMAND:		DATE/TIME:	

Toxicity Test Sample Chain of Custody  
(Please complete all information)

#572



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number B-2 8 Hr. Frequency of collection \_\_\_\_\_ Volume \_\_\_\_\_

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.02 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Kath C. [Signature]</u>	Date <u>2-12-97</u>	Time <u>10:00 AM</u>
2.	Relinquished by <u>Kath C. [Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Relinquished by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-1618 Arrival Temperature 2.0C On ice? yes

Color Tan Odor earthy Solids none

pH 7.26 DO (mg/L) 7.8 Conductivity (umhos/cm) 1800 @ 15°C

Salinity (ppt) 1 TRC (mg/L) NA Method NA

JPDES#.

NPDES#: N/A  
ORGANISM SOURCE: ABS

CLIENT: Dana Ann

JRA BATCH#: 6202

OUTFALL: 2 B-2  
HATCH DATE: 2/6/97

B-2[illegible]



Atlantic Mysisidopsis bahia Toxicity Test

OBSERVATIONS

IRA# 97-1618

TEST# N/A

CLIENT: Orega CMA

ORGANISM SOURCE: APS

IRA BATCH#: 1/4/2

OUTFALL: 2 B-2

HATCH DATE: 2/8/97

TIME (%)	REP	HOURS	NUMBER OF LIVE ORGANISMS (Control $\geq$ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	10	10	10	10	8.66	8.31	8.03	7.5	6.4	6.5	20.3	20.0	20.6	20	
100	B	10	10	10	10											
2.25	A	10	10	10	10	8.62	8.27	8.00	7.7	6.6	6.2	20.4	20.0	20.6	20	20
100	B	10	10	10	10											
12.5	A	10	10	9	9	8.51	8.25	7.94	7.8	6.5	5.8	20.4	20.0	20.6	20	20
95	B	10	10	10	10											
25	A	10	10	10	10	8.38	8.21	7.91	8.0	6.7	5.4	20.3	20.0	20.6	20	20
100	B	10	10	10	10											
50	A	10	10	10	10	8.20	8.13	7.94	8.1	6.8	5.4	20.0	20.0	20.6	20	20
100	B	10	10	10	10											
100	A	10	10	9	9	7.87	7.96	7.96	8.3	6.8	6.2	19.5	20.0	20.6	20	20
90	B	10	10	9	9											

INIT	088	1040	053	
DATE 1997	2/12	2/13	2/14	
TIME	1615	1630	1525	1550 EUC

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

NPDES#: N/ACLIENT: Ocean ODUOUTFALL: 2 B-2

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.5	7.87	/	8.3	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

1997

Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date 2/12 2/13 2/13 2/14 \_\_\_\_\_  
 Method \_\_\_\_\_ Method \_\_\_\_\_ Method \_\_\_\_\_ Time 1718 0850 1645 0859 \_\_\_\_\_  
 Minutes \_\_\_\_\_ Amount \_\_\_\_\_ Amount \_\_\_\_\_ Init LDG LDG LDG LDG \_\_\_\_\_

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

## TREATMENT PREPARATIONS CALCULATIONS

CONC (% mg/L ) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l )	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Dilute to 1000
6.25			62.5	
12.5			125	
25			250	
50			500	
100			1000	0

CALCULATIONS PERFORMED BY: RS

VERIFICATION OF:

VERIFIED BY:

ANALYST SIGNATURES

INITIALS

TREATMENT PREPARATION CALCULATIONS

NUMBER OF ORGANISMS

STATISTICAL ANALYSES

RS

TEST CHAMBER SIZE: 250mLTYPE: polyethyleneVOLUME OF TEST SOLUTION: 200mL

## EQUIPMENT

Make

Model

Serial Number

Probe Number

pH meter

Corning

245

5147

DO meter

YSI

54ARC

14522

N

SCT meter

YSI

33

4458

A

Temperature

VWR

digi-thermo

7A5 QCI

N/A

Chlorine

Fischer &amp; Porter

321A009U23

3811A940230-1

A

COMMENTS:



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 571

Sample ID: B-3

JRA ID: 97-1617

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Claiborne  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-1617

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:10</u>
Test End:	<u>2/14/97</u>	<u>15:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	.
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.87 - 7.97</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	



JRA #: 97-1617 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>5.1 - 8.2</u>	<u>6.4 - 7.5</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A  
Growth/Reproduction: N/A

JRA #: 97-1617 Test Type&Organism: Acute Mysisidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-1617

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 2/12/97                      Time 16:10

Test End:                      Date 2/14/97                      Time 16:06

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 6 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.97 - 8.08</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1617 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1617 Test Type&Organism: Acute Cyprinodon variegatus

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 2/18/97  
Result (mg/L) 27  
QC Range (mg/L) 0 thru 34

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

## CHAIN-OF-CUSTODY RECORD

## &amp; ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY  
CODE 930 BLDG Z-140  
9742 MARYLAND AVENUE  
NORFOLK, VA 23511 - 3095  
ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852

## CLIENT INFORMATION

COMPANY/COMMAND: DEANNA A AG CODE:  
CONTACT: Douglas Kink  
PHONE: 433-3439 EXT:      FAX:       
J.O.#: 1912290  
SIGNATURE:       
PERMIT NO.:     

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES /CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER
571	B-3	START STOP	3/1/97 3/1/97	0700 PM	G	HY	L	1	1	TOXICITY MSB/EL	97-1617	4°C	4°C
572	B-2	START STOP	3/1/97 3/1/97	0700 PM							97-1618		
573	B-1	START STOP	3/1/97 3/1/97	0700 PM							97-1619		
574	A-3	START STOP	3/1/97 3/1/97	0700 PM							97-1620		
575	A-2	START STOP	3/1/97 3/1/97	0700 PM							97-1621		
576	A-1	START STOP	3/1/97 3/1/97	0700 PM							97-1622		
577	MIXED L & R	START STOP	3/1/97 3/1/97	1100 AM	G	HY	L	1	1		97-1623		

TYPE	MATRIX	SW	SWIPE	CONTAINER				PRESERVATIVE			
				P - PLASTIC	B - BAG	A - AMBER (glass)		1 - COOL TO 4°C	5 - HCL pH<2	6 - 0.008% Na2S2O3, 4°C	
G - GRAB	L - LIQUID	S - SOLID	GS - GAS	GL - GLASS	C - CARTRIDGE	TL - TEFLON LINED LID		2 - HNO3 pH<2	3 - H2SO4 pH<2	7 - FIELD FILTER	
CF - COMPOSITE, FLOW	SS - SEMI SOLID			T - TEFLON	H - HEXANE RINSED			4 - NaOH pH>12	8 - NONE		
CT - COMPOSITE, TIME				V - VOA							

TURNAROUND (Days):      (FOR RUSH TURNAROUND STATE REASON BELOW)  
COMMENTS:     

REGULATION APPLIED:	
RCRA ( )	HRSD ( )
SDWA ( )	TSCA ( )
CWA ( )	PHOTO ( )
CAA ( )	OTHER ( )

SAMPLING/COLLECTION CHARGE: \$       
POSSIBLE SAMPLE HAZARDS:       
COMMENTS:     

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

D.O. NUMBER: 227/067 INIT:       
CONTRACT LAB:      DATE:       
CONTRACT NO(S):       
OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).  
\*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

HOLDING TIME ( )		CHECK BOX & INITIAL IF OKAY:		SAMPLES VERIFICATION		REASON:	
RELINQUISHED BY:	RECEIVED BY:	CONTAINERS ( )	INITIAL:	REJECTED ( )	REASON:	COMPANY/COMMAND:	DATE/TIME:
RELINQUISHED BY:	RECEIVED BY:					COMPANY/COMMAND:	DATE/TIME:
RELINQUISHED BY:	RECEIVED BY:					COMPANY/COMMAND:	DATE/TIME:
RELINQUISHED BY:	RECEIVED BY:					COMPANY/COMMAND:	DATE/TIME:

**CONTINUATION SHEET**

SHEET 2 OF 2

CODE 930 BLDG Z-140

NORFOLK, VA 23511 - 3095

P.O.C.:

COMMAND: OCS-2000 NAC



D.O. NUMBER:	INIT.:
CONTRACT LAB:	DATE:
CONTRACT NO.(S):	
OFFICIAL USE ONLY	

Arrival Temp. 2.0°C 1503

**COMMENTS:**

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).  
\*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM -- 3:30 PM)

••FOR LAB USE ONLY!!

HOLDING TIME ( )      CONTAINERS ( )      INITIAL:      REJECTED ( )

RELINQUISHED BY: Sinal REC'D BY: [Signature]

SCORING NUMBER ( ) INITIAL: \_\_\_\_\_

REJECTED ( ) \_\_\_\_\_

RELINQUISHED BY:	REC'D BY:	COMPAN:
RELINQUISHED BY:	REC'D BY:	COMPAN:

RECEIVED BY:	REC'D BY:	COMPAN:
RELINQUISHED BY:	REC'D BY:	COMPAN:

RECEIVED BY: \_\_\_\_\_  
RELINQUISHED BY: \_\_\_\_\_  
COMPANY: \_\_\_\_\_  
COMPANY: \_\_\_\_\_

REC'D BY:	COMPAN:
-----------	---------



Toxicity Test Sample Chain of Custody  
(Please complete all information)

#571



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number B-3. 8 Hr. Frequency of collection \_\_\_\_\_ Volume \_\_\_\_\_

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.09 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment Bayside

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Keth C. P.</u>	Date <u>2/12/97</u>	Time <u>10:00 A.M.</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 A.M.</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Received by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

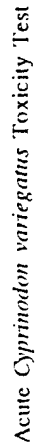
FOR REED LAB USE ONLY

JRA# 97-1617 Arrival Temperature 2.0°C On ice? yes

Color tan Odor earthy Solids none

pH 7.32 DO (mg/L) 8.0 Conductivity (umhos/cm) 1800 @ 19.3 °C

Salinity (ppt) 1 TRC (mg/L) NA Method NA



## OBSERVATIONS

JRA# 97-1617

NPDES#: N/A

NPDES#: N/A  
ORGANISM SOURCE: ABS

CLIENT: Deana

COX-1

OUTFALL: 1 B-3

ORGANISM SOURCE:

JRA BATCH#: 602

HATCH DATE: 2/6/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



VIA  
#SJDIN

CLIENT: *Negra*

OUTFALL: ( B-3

ORGANISM SOURCE: ABS

JRA BATCH#: 1/442

HATCH DATE: 2/8/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* "

GENERAL COMMENTS

JRA# 97-1617

NPDES#: NA CLIENT: Oceana EDL OUTFALL: B-3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.3	7.97	/	8.2	/	1	20	/	/

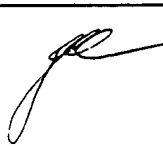
DO Adj. pH Adj. TRC Adj. Feedings (mysid)

1997

Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date 2/12 2/13 2/13 2/14 \_\_\_\_\_  
 Method \_\_\_\_\_ Method \_\_\_\_\_ Method \_\_\_\_\_ Time 1718 0850 1645 0859 \_\_\_\_\_  
 Minutes \_\_\_\_\_ Amount \_\_\_\_\_ Amount \_\_\_\_\_ Init LDC LDC LDC LDC \_\_\_\_\_

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			DS
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	DS		
6.25			62.5		STATISTICAL ANALYSES	NA		
12.5			125					
25			250					
50			500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: DS								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	DS 226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	Buxton VWR	digi-thermo	1046303	7AS DC1
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

February 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 577

Sample ID: Mixed L. of R.R.

JRA ID: 97-1623

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Charlone  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mixed L. of R.R. JRA #: 97-1623

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	<u>Date</u> <u>2/12/97</u>	<u>Time</u> <u>16:40</u>
Test End:	<u>2/14/97</u>	<u>16:00</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.94 - 8.09</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1623 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>5.5 - 8.4</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1623 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments




**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mixed L. of R.R. JRA #: 97-1623

Test Period for Which Data is Being Submitted:  
(i.e., first quarter, semiannual, or annual) \_\_\_\_\_

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:40</u>
Test End:	<u>2/14/97</u>	<u>17:00</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.04 - 8.09</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

## RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.4</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

## TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1623 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mixed L. of R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

# CHAIN-OF-CUSTODY RECORD

## & ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY  
 CODE 930 BLDG Z-140  
 9742 MARYLAND AVENUE  
 NORFOLK, VA 23511 - 3095  
 PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

## CLIENT INFORMATION

COMPANY/COMMAND: DEANNA A. AS CODE:  
 CONTACT: Douglas Kivk  
 PHONE: 433-3439 EXT:      FAX:       
 J.O. #: 191221C  
 SIGNATURE:       
 PERMIT NO.:     

LAB USE ONLY LINE ITEM #   SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START	2/1/97	0700	G	HY	L	1	1	2010/1/1/97 MB/20	97-1617	4°C	4°C
572	B-2	STOP	2/1/97	PM									
573	B-1	START	2/1/97	0700									
574	A-3	STOP	2/1/97	PM									
575	A-2	START	2/1/97	0700									
576	A-1	STOP	2/1/97	PM									
577	MIXED	START	2/1/97	1100	G	HY	L	1	1				

TYPE	MATRIX	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	1 - COOL TO 4 C
CF - COMPOSITE, FLOW	S - SOLID	B - BAG	5 - HCL, pH<2
CT - COMPOSITE, TIME	GS - GAS	C - CARTRIDGE	2 - HNO3, pH<2
	SS - SEMI SOLID	TL - TEFLON LINED LID	6 - 0.008% Na2S2O3, 4 C
		V - VOA	3 - H2SO4, pH<2
			4 - NaOH, pH>12
			7 - FIELD FILTER
			8 - NONE

TURNAROUND (Days):      (FOR RUSH TURNAROUND STATE REASON BELOW)  
 COMMENTS:     

REGULATION APPLIED:	
RCRA ( )	HRSD ( )
SDWA ( )	TSCA ( )
CWA ( )	PHOTO ( )
CAA ( )	OTHER ( )

SAMPLING/COLLECTION CHARGE: \$       
 POSSIBLE SAMPLE HAZARDS:       
 COMMENTS:     

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

Arrival Temp. 2.6°C

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \*  
 \*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY!!		CHECK BOX & INITIAL IF OKAY:		SAMPLES VERIFICATION		REASON:	
HOLDING TIME ( )	CONTAINERS ( )	INITIAL:	REJECTED ( )	REASON:	REASON:	REASON:	REASON:
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>
RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>	RELINQUISHED BY: <u>    </u>

D.O. NUMBER: 227/067 INIT.:       
 CONTRACT LAB:      DATE:       
 CONTRACT NO.(S):      OFFICIAL USE ONLY

# CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM



PWC ENVIRONMENTAL LABORATORY  
CODE 930 BLDG Z-140  
9742 MARYLAND AVENUE  
NORFOLK, VA 23511 - 3095  
PH: (757)445-8851 FAX: (757)445-8852

CONTINUATION SHEET

SHEET 2 OF 2

P.O.C.: Douglas Kirk  
COMMAND: Oceana NAS

LAB USE ONLY LINE ITEM # / SAMPLE NO.	SAMPLE ID / LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS			PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER	
00028 (1)	578	START	9/11/91	11:20	G	HY	L	1	1	TOXICITY		97.624		4248
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												
		START												
		STOP												

COMMENTS:

Arrival Temp. 20°C

D.O. NUMBER: \_\_\_\_\_ INIT.: \_\_\_\_\_

CONTRACT LAB: \_\_\_\_\_ DATE: \_\_\_\_\_

CONTRACT NO.(S): \_\_\_\_\_

OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

SAMPLES VERIFICATION

HOLDING TIME ( ) CONTAINERS ( ) REJECTED ( ) INITIAL: \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ RECD BY: \_\_\_\_\_ COMPANY/COMMAND: BCS Inc DATE/TIME: 2/12/91 133

RELINQUISHED BY: \_\_\_\_\_ RECD BY: \_\_\_\_\_ COMPANY/COMMAND: BCS DATE/TIME: 2/12/91 1405

RELINQUISHED BY: \_\_\_\_\_ RECD BY: \_\_\_\_\_ COMPANY/COMMAND: BCS DATE/TIME: \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ RECD BY: \_\_\_\_\_ COMPANY/COMMAND: BCS DATE/TIME: \_\_\_\_\_

#577

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 11:00 AM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number Mix. of R.R. Frequency of collection \_\_\_\_\_ Volume 2 L.

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.35 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

**Print & Sign Names**

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:00</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Relinquished by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

**FOR REED LAB USE ONLY**

JRA# 97-1623 Arrival Temperature 2.0°C On ice? yes

Color TC1 Odor earth Solids 100

pH 7.43 DO (mg/L) 9.0 Conductivity (umhos/cm) 1800 @ 19.7°C

Salinity (ppt) 1 TRC (mg/L) NA Method NA







acute *Myxidopsis bathia* Toxicity Test

OBSERVATIONS

JRA# 97-1623

IPDES#: N/A CLIENT: Oceana OUTFALL: 7 MIX L. & R.R.  
ORGANISM SOURCE: ABS JRA BATCH#: M442 HATCH DATE: 2/8/97

TIME (%)	REP	HOURS	NUMBER OF LIVE ORGANISMS (Count $\geq$ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) ( $>4.0$ , $<9.1$ @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	0	24	0	24	0	24	48	0	END
0	A	0	10	10	8.46	8.31	7.5	6.4	20.3	20.0	20.6	20	20
1.25	B	0	10	10	8.60	8.34	7.7	6.8	20.4	20.0	20.6	20	20
6.25	A	0	10	10	8.58	8.26	7.8	6.0	20.4	20.0	20.6	20	20
12.5	B	0	10	10	8.49	8.20	8.0	5.6	20.3	20.0	20.6	20	20
100	A	0	10	10	8.30	8.17	8.1	5.8	20.1	20.0	20.6	20	20
100	B	0	10	10	8.01	8.00	8.4	6.1	19.7	20.0	20.6	20	20
100	A	0	10	10									
100	B	0	10	10									
INIT			100	100									
DATE 1997			2/12	2/13									
TIME			1640	1554									

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



NPDES#: N/A CLIENT: Oceana COA

OUTFALL: 7 Mix. 42.

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1100	2/12/97	19.7	8.09	/	8.4	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date Date Date Date 2/12 2/13 2/13 2/14  
 Method Method Method Time 1718 0850 1645 0859  
 Minutes Amount Amount Init LDC LDC LDC LDC

DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

## TREATMENT PREPARATIONS CALCULATIONS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Volume to 1000
6.25	↓	↓	62.5	↓
12.5	↓	↓	125	↓
25	↓	↓	250	↓
50	↓	↓	500	↓
100	↓	↓	1000	0

CALCULATIONS PERFORMED BY: RB

VERIFICATION  
OF:VERIFIED  
BY:ANALYST  
SIGNATURES

INITIALS

TREATMENT  
PREPARATION  
CALCULATIONSNUMBER OF  
ORGANISMSSTATISTICAL  
ANALYSES

RB

RB

N/A

RB

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	Bentley VWR	dici-thermo	745 DC1	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 578

Sample ID: Feed S.

JRA ID: 97-1624

Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

Elaine Claiborne

for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-1624

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:45</u>
Test End:	<u>2/14/97</u>	<u>16:02</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.63 - 7.92</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1624 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.7 - 8.3</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1624

Test Type&Organism: Acute *Mysidopsis bahia*

## TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&lt;6.25%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

DO dropped below 4.0 mg/L in the 12.5 - 100% treatments.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-1624

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>2/12/97</u>	Time <u>16:45</u>
Test End:	<u>2/14/97</u>	<u>17:05</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.63 - 8.15</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

## RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>&lt;0.1 - 8.3</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

## TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>



JRA #: 97-1624 Test Type&Organism: Acute Cyprinodon variegatus

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50	31%		
Survival	(NOEC)	(LOEC)	
	Normal Distribution (yes/no)		
	Homogeneous Variance (yes/no)		
Growth or Reproduction	(NOEC)	(LOEC)	
	Normal Distribution (yes/no)		
	Homogeneous Variance (yes/no)		
Reference Toxicant Test Date	2/18/97		
Result (mg/L)	27		
QC Range (mg/L)	0	thru	34

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

DO dropped below 4.0 mg/L in all treatments.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

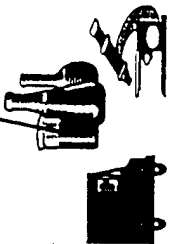
NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		

# CHAIN-OF-CUSTODY RECORD



**& ANALYSIS REQUEST FORM**  
 PWC ENVIRONMENTAL LABORATORY  
 CODE 930 BLDG Z-140  
 9742 MARYLAND AVENUE  
 NORFOLK, VA 23511 - 3095  
 ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852

## CLIENT INFORMATION

COMPANY/COMMAND: DEANDA, N ASCODE:  
 CONTACT: Douglas K MC  
 PHONE: 733 3439 EXT:      FAX:       
 J.O.#: 1912240  
 SIGNATURE:       
 PERMIT NO.:     

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START	2/1/97	0700	G	HY	L		1	TRAILER MB/LL	97-1417	4°C	4°C
572	B-2	STOP	2/1/97	0700									
573	B-1	START	2/1/97	0700									
574	A-3	STOP	2/1/97	0700									
575	A-2	START	2/1/97	0700									
576	A-1	STOP	2/1/97	0700									
577	MIXED L & R	START	2/1/97	1100	G	HY	L		1		97-1421		
		STOP	2/1/97	1100							97-1622		
											97-1423		

TYPE	MATRIX	SW	SWIPE	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID			P - PLASTIC	1 - COOL TO 4°C
CF - COMPOSITE, FLOW	S - SOLID			GL - GLASS	2 - HNO <sub>3</sub> ; pH<2
CT - COMPOSITE, TIME	GS - GAS			T - TEFLON	3 - H <sub>2</sub> SO <sub>4</sub> ; pH<2
	SS - SEMI SOLID			V - VOA	4 - NaOH; pH>12
					5 - HCL, pH<2
					6 - 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> , 4°C
					7 - FIELD FILTER
					8 - NONE

TURNAROUND (Days):      (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:     

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

REGULATION APPLIED:  
 RCRA ( ) HRSD ( )  
 SDWA ( ) TSCA ( )  
 CWA ( ) PHOTO ( )  
 CAA ( ) OTHER ( )

SAMPLING/COLLECTION CHARGE: \$     

POSSIBLE SAMPLE HAZARDS:     

COMMENTS:     

Arrival Temp. 26°C

D.O. NUMBER: 227/067 INIT:     

CONTRACT LAB:      DATE:     

CONTRACT NO.(S):      OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \*  
 \*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY:  
 HOLDING TIME ( ) CHECK BOX & INITIAL IF OKAY:      SAMPLES VERIFICATION:      REJECTED ( ) REASON:     

RETINQUISHED BY:      REC'D BY:      INITIAL:     

COMPANY/COMMAND:      DATE/TIME:     

RETINQUISHED BY:      REC'D BY:      INITIAL:     

COMPANY/COMMAND:      DATE/TIME:     

RETINQUISHED BY:      REC'D BY:      INITIAL:     

COMPANY/COMMAND:      DATE/TIME:

## CHAIN-OF-CUSTODY RECORD

## &amp; ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

CONTINUATION SHEET

SHEET 2 OF 2

P.O.C.:

COMMAND: OCEANOGRAPHY

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO.											pH	TEMPERATURE	
000287	578	Feeds	START	2/11/97	11:20 AM	G	HY	L	1	1	TOXICITY	97.624	42.48	
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)



Facility OLD DOMINION UNIVERSITY  
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.  
KDH 135 NORFOLK VA 23529-0241

County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_

Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_

Type of sample ☒ (Grab): Date 2/11/97 Time 11:00 AM

\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_

To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number Feed S. Frequency of collection \_\_\_\_\_ Volume 2 L.

Temperature of sample in sample collection device 28.1°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? \_\_\_\_\_ If yes - limit (mg/L) \_\_\_\_\_

Field pH 6.77 Field Total Residual Chlorine NA

Comments/Sample description \_\_\_\_\_

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50  
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

**Print & Sign Names**

1. Relinquished by H. YANG Date 2/12/97 Time 9:00 AM

Received by Keith Cantel Date 2-12-97 Time 10:00 AM

2. Relinquished by Keith Cantel Date 2-12-97 Time 10:15 AM

Received by S. Gordin Date 2-12-97 Time 12:15

Relinquished by James Date 2-12-97 Time 1405

Relinquished by James Date 2/12/97 Time 1405

FOR REED LAB USE ONLY

JRA# 97-1624 Arrival Temperature 2.0°C On ice? yes

Color light tan Odor fresh Solids none

pH 7.29 DO (mg/L) 8.2 Conductivity (umhos/cm) 1700 @ 19.2°C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A



## OBSERVATIONS

JRA# 97-1624

NPDES#: N/A CLIENT: Qerna QP# OUTFALL: 8 Feb 5,  
ORGANISM SOURCE: ABS JRA BATCH#: C22 HATCH DATE: 2/6/97

(Indicate comments with an \* and document on General Comments page)

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

LC50 = 31%

DATE: 2/12/97 TEST NUMBER: 97-1624 DURATION: 48 hours  
 TOXICANT : Feed S.  
 SPECIES: C. variegatus

RAW DATA: Concentration ---- (%)	Number Exposed	Mortalities
.00	20	0
6.25	20	0
12.50	20	3
25.00	20	1
50.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 30.78  
 95% LOWER CONFIDENCE: 26.99  
 95% UPPER CONFIDENCE: 35.10

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.  
 ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

---






 NPDES#: NA CLIENT: Ocean ODU OUTFALL: S FW S

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1100	2/12/97	19.2	7.63	/	8.3	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

 Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date 2/12 2/13 2/13 2/14  
 Method \_\_\_\_\_ Method \_\_\_\_\_ Method \_\_\_\_\_ Time 1718 0850 1645 0859  
 Minutes \_\_\_\_\_ Amount \_\_\_\_\_ Amount \_\_\_\_\_ Init L06 L06 L06 LX

 DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

## TREATMENT PREPARATIONS CALCULATIONS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Volume to 1000
6.25	↓	↓	62.5	↓
12.5	↓	↓	125	↓
25	↓	↓	250	↓
50	↓	↓	500	↓
100	↓	↓	1000	0

 CALCULATIONS PERFORMED BY: RS

 VERIFICATION  
OF:

 VERIFIED  
BY:

 ANALYST  
SIGNATURES

INITIALS

 TREATMENT  
PREPARATION  
CALCULATIONS

 NUMBER OF  
ORGANISMS

 STATISTICAL  
ANALYSES

 TEST CHAMBER SIZE: 250mL TYPE: polyethylene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Beckman VWR</u>	digi-thermo	<u>745 QC1</u>	N/A
Chlorine	Fischer & Porter	821A000U23	8811A940230-1	A

COMMENTS:

**ACUTE TOXICITY TEST RESULTS**

**60 ppm AFFF**

**MARCH 25, 1997**



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 679

Sample ID: A-1

JRA ID: 97-3354

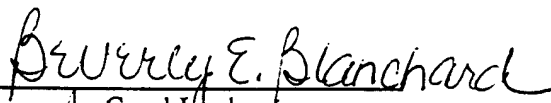
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3354

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:04</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.02 - 8.15</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3354 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.2 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3354

Test Type&Organism: Acute *Mysidopsis bahia*

## TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50

&gt;100%

Survival

(NOEC)

(LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction

(NOEC)

(LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date

3/26/97

Result (mg/L)

0.09

QC Range (mg/L)

0.04

thru

0.24

4. Equipment

(Make

Model

Serial #

Probe #)

pH meter

Corning

245

5147

G

DO meter

YSI

54ARC

14522

N

SCT meter

YSI

33

4458

A

Temperature

VWR

digi-thermo

7A5 QC1

N/A

Chlorine

Fischer

&amp; Porter 821A009423

8811A940230-1

A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3354

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/26/97                      Time 16:35

Test End:                      Date 3/28/97                      Time 16:19

Test Type (chronic/acute):      Acute

Test Organism:      Cyprinodon variegatus      Age: 4 days

Test Chamber Size:      250 mL

Volume of Test Solution per Chamber:      200 mL

Diluent:      20 ppt Forty Fathoms

Aeration Period (if necessary):      None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.02 - 8.19</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3354 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>



JRA #: 97-3354 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

PWC #679



Facility ODU  
Address Dept. of Civil & Environ. Eng. ODU  
Norfolk, VA 23508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print & sign) Yang Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 8:00 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-1, 8 Hr. Frequency of collection \_\_\_\_\_ Volume 2 L.

Temperature of sample in sample collection device 25.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No. If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.51 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description A-1, 8 Hr.

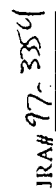
Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon Variegatus & Mysid Shrimp  
Method of shipment Rail

Print & Sign Names

1. Relinquished by -Yang Date 03/25/97 Time 8:00 PM  
Received by Kith Confel Date 3-26-97 Time 11:00  
2. Relinquished by Kith Confel Date 3-26-97 Time 11:10  
Received by Althea Miller Date 3/26/97 Time 1125 #679  
See PWC C.O.C.

FOR REED LAB USE ONLY

JRA# 97-3354 Arrival Temperature 2.4°C On ice? yes  
Color +Cn Odor earthy Solids none  
pH 7.92 DO (mg/L) 9.0 Conductivity (µmhos/cm) 1800 @ 19.2°C  
Salinity (ppt) ( TRC (mg/L) — Method —



### Adult *Cyprinodon variegatus* Toxicity Test

## OBSERVATIONS

UPDES#: 11(A

CLIENT: Dream

2008

OUTFALL:  
A-1

ORGANISM SOURCE: ABS

JRA BATCH#: 226

MATCH DATE: 3/22/97

[illegible]

INIT	053	00	053		
DATE 1997	3/26	3/27	3/28		
TIME	1635	1604	1619		

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

## OBSERVATIONS

JRA# 97-3354

PDES#: N/A

CLIENT: Dean

OUTFALL: A-1

ORGANISM SOURCE: Chasapeake cultures  
JIRA BATCH#: M434  
HATCH DATE: 3/25/97 143a 0805

[illegible]

" *C. variegatus* "

## GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: A-1

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	19.2	8.02	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28  
 Method 1700 Method 0950 Method 1700 Method 1020  
 Minutes 033 Amount LXG Amount LXG Amount LXG

DILUENT 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			<u>BS</u>
Control	1000	100	0	Diluent + 1000	NUMBER OF ORGANISMS	<u>033</u>		
6.25			62.5		STATISTICAL ANALYSES	<u>N/A</u>		
12.5			125					
25			250					
50			500					
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: <u>BS</u>								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u> <u>203</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>WWR</u>	digi-thermo	<u>7A5 QCI</u>	n/a
Chlorine	Fischer & Porter	321A009U23	8811A940230-1	A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 678

Sample ID: A-2

JRA ID: 97-3353

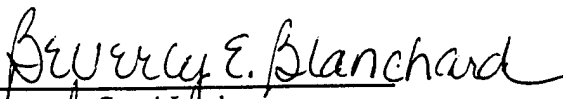
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3353

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:06</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.04 - 8.18</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3353 Test Type&Organism: Acute Mysidopsis bahia

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA # 97-3353 Test Type&Organism: Acute *Mysidopsis bahia*

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3353

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.04 - 8.20</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3353 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA # 97-3353 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

pwc # 678



Facility ODU  
Address Dept. Civil & Environ Eng. ODU.  
Norfolk, VA 22508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print&sign) Yang Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-2. 8th Frequency of collection \_\_\_\_\_ Volume 2L

Temperature of sample in sample collection device 25.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.56 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description A-2. 8th

Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon Variegatus & Mysid shrimp  
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM  
Received by Keith C. Felt Date 3-26-97 Time 11:00  
2. Relinquished by Keith C. Felt Date 3-26-97 Time 11:00  
Received by Althea Miller Date 3/26/97 Time 1125 #678  
22 PWC C-02

FOR REED LAB USE ONLY

JRA# 97-3353 Arrival Temperature 24°C On ice? yes  
Color tan Odor earthy Solids none  
pH 7.96 DO (mg/L) 8.9 Conductivity (umhos/cm) 1800 @ 19.3 °C  
Salinity (ppt) 1 TRC (mg/L) — Method —







Ure *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-3353

PDES#: N/A CLIENT: Ocean ODU OUTFALL: A-2  
ORGANISM SOURCE: Chesapeake Bay JRA BATCH#: M454 HATCH DATE: 3/25/97 1430-0800

Time (%)	REP ↓	HOURS →	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	END
0	A	0	10	10	10	8.44	8.28	8.24	25	22	18	20	20
100	B	10	10	10	10	8.44	8.23	8.21	24	21	20	20	20
2.25	A	10	10	10	10	8.42	8.23	8.21	24	21	20	20	20
100	B	10	10	10	10	8.31	8.22	8.25	23	21	20	20	20
12.5	A	10	10	10	10	8.25	8.15	8.22	20	20	21	20	20
100	B	10	10	10	10	8.04	8.18	8.14	19.3	20.1	20.1	20	20
25	A	10	10	10	10								
100	B	10	10	10	10								
50	A	10	10	10	10								
100	B	10	10	10	10								
100	A	10	10	10	10								
100	B	10	10	10	10								
INIT			08	28	05								
DATE 1997			3/26	3/27	3/28								
TIME			1630	1645	1656								

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* " " "

GENERAL COMMENTS

JRA# 97-3353

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: A-2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	19.3	8.04	✓	9.0	✓	1	20	✓	✓

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/26 Date 3/27 Date 3/28  
 Method 1700 Method 0950 Method 1700 Method 1020  
 Minutes 1700 Amount 100 Amount 100 Init 100 100 100 100

DILUENT: 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Diluent + 1000	NUMBER OF ORGANISMS	100		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: <u>DS</u>								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 200 200  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature Bioson VWR diel-thermo 745 QCI n/a  
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 677

Sample ID: A-3

JRA ID: 97-3352

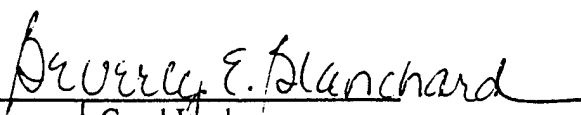
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-3352

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   3/26/97                      16:30

Test End:                      3/28/97                      16:07

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age:    1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.07 - 8.16</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3352 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3352 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3352

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:21</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.08 - 8.19</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3352 Test Type&Organism: Acute (*Cyprinodon variegatus*)

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>



JRA #: 97-3352 Test Type&Organism: Acute (*Cyprinodon variegatus*)

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

pwc # 677



Facility ODU  
Address Dept. Civil & Environ. Eng. ODU  
Norfolk, VA 23508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print&sign) Yang Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number A-3 8Hr Frequency of collection \_\_\_\_\_ Volume 2L

Temperature of sample in sample collection device 25.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.59 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description A-3. 8Hr

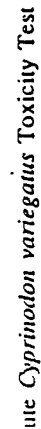
Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon Variegatus & Mysid shrimp  
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM  
Received by Keith Cuff Date 3-26-97 Time 11:00 AM  
2. Relinquished by Keith Cuff Date 3-26-97 Time 11:10 AM  
Received by U. Anderson Date 3/26/97 Time 11:25 #677  
See PWC C-02

FOR REED LAB USE ONLY

JRA# 97-3352 Arrival Temperature 2.4°C On ice? yes  
Color tan Odor earthy Solids none  
pH 8.03 DO (mg/L) 8.9 Conductivity (umhos/cm) 1800 @ 19.4°C  
Salinity (ppt) 1 TRC (mg/L) - Method -



## OBSERVATIONS

JRA# 97-3352

#SJD  
A

CLIENT: Ocean

Q04

OUTFALL: A-3  
HATCH DATE: 3/22/97

ORGANISM SOURCE: ABS

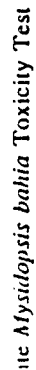
JRA BATCH#: C206

HATCH DATE: 3/22/97

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



## OBSERVATIONS

JRAH 97-3352

DES#:

DES#: N/A CLIENT: Cultures  
ORGANISM SOURCE: Chesapeake

CLIENT: Dean

OUTFALL: A-3

OUTFALL: A-3  
 HATCH DATE: 3/25-26/97 1430-0800

HATCH DATE: 3/25-26/67 1430-0800

(Indicate comments with an \* and document on General Comments page)

REV 3/19/96

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* "

GENERAL COMMENTS

JRA# 97-3352

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: A3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L) >4;<9.1	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt) 19-21	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/26/97 2100	3/26/97	19.4	8.09	/	7.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28  
 Method 1700 Method 1700 Method 1700 Method 1700  
 Minutes 100 Amount 100 Amount 100 Amount 100

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Diluent 1000	NUMBER OF ORGANISMS	100		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: <u>BS</u>								

TEST CHAMBER SIZE: 250mlTYPE: PolystyreneVOLUME OF TEST SOLUTION: 200ml

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>26</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>VWR</u>	digit-thermo	<u>745 QCI</u>	n/a
Chlorine	Fischer & Porter	321A009U23	3811A940230-1	A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 676

Sample ID: B-1

JRA ID: 97-3351

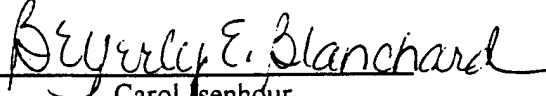
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3351

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start: Date 3/26/97 Time 16:30

Test End: 3/28/97 16:09

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.05 - 8.14</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3351 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.8 - 9.2</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3351 Test Type&Organism: Acute *Mysidopsis bahia*

### TEST RESULTS (Continued)

### 3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) \_\_\_\_\_ (LOEC) \_\_\_\_\_  
 Normal Distribution (yes/no) \_\_\_\_\_  
 Homogeneous Variance (yes/no) \_\_\_\_\_

Growth or Reproduction (NOEC) \_\_\_\_\_ (LOEC) \_\_\_\_\_  
 Normal Distribution (yes/no) \_\_\_\_\_  
 Homogeneous Variance (yes/no) \_\_\_\_\_

Reference Toxicant Test Date	3/26/97		
Result (mg/L)	0.09		
QC Range (mg/L)	0.04	thru	0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
---------------------	-------	-------	----------	----------

pH meter Corning 245 5147- G

DO meter	YSI	54ARC	14522	N
----------	-----	-------	-------	---

SCT meter	YSI	33	4458	A
-----------	-----	----	------	---

Temperature	VWR	digi-thermo	7A5 QC1	N/A
-------------	-----	-------------	---------	-----

Chlorine	Fischer & Porter	821A009423	8811A940230-1	A
----------	---------------------	------------	---------------	---

### 5. Protocol Deviations/Comments

---

---

---

---

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3351

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:26</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.01 - 8.17</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3351 Test Type&Organism: Acute (*Cyprinodon variegatus*)

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.2</u>	<u>6.6 - 8.2</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3351 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

pwc # 676

**Toxicity Test Sample Chain of Custody**  
(Please complete all information)



Facility ODU  
 Address Dept. Civil & Environ. Eng. ODU.  
Norfolk, VA 23508.  
 County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
 NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
 Sample collected by (print & sign) yang Affiliation \_\_\_\_\_  
 Type of sample ✓ (Grab): Date 03/25/97 Time 9:00 PM  
 \_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
 To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number B-1. 8 Hr. Frequency of collection \_\_\_\_\_ Volume 2 L.

Temperature of sample in sample collection device 25.0°C.

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No. If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.64 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description B-1. 8 Hr.

Type of test(s) to be performed Acute Toxicity Testing  
 (Specify organisms) Cyprinodon Variegatus & Mysid shrimp.  
 Method of shipment Reel

**Print & Sign Names**

1. Relinquished by yang Date 03/25/97 Time 9:00 PM.  
 Received by Keith Cuff Date 3-26-97 Time 11:00 a.m.  
 2. Relinquished by Keith Cuff Date 3-26-97 Time 11:10 a.m.  
 Received by Reeder Jones Date 3/26/97 Time 11:25 676  
See PWC C-0C

**FOR REED LAB USE ONLY**

JRA# 97-3351 Arrival Temperature 2.4°C On ice? yes  
 Color tan Odor earthy Solids none  
 pH 7.50 DO (mg/L) 8.8 Conductivity (umhos/cm) 1900 @ 20.0°C  
 Salinity (ppt) 1 TRC (mg/L) — Method —

*Cyprinodon variegatus* Toxicity Test

## OBSERVATIONS

JRA# 97-3351

PDES#: 111A

CLIENT: Deena Dora

2108

OUTFALL:  $\beta$ -1

ORGANISM SOURCE: ABS

JRA BATCH#: C206

HATCH DATE: 3/22/97

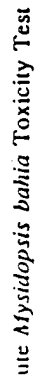
[illegible]

INIT	083	083	083
DATE 1997	3/26	3/27	3/28
TIME	1635	1425	1626

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96





## OBSERVATIONS

JRA# 97-351

PDES#:

PPDES#: N/A CLIENT: Cultures  
ORGANISM SOURCE: Chusquea

CLIENT: Dean

OUTFALL; B-1

HATCH DATE: 3/25.26/57 142-0800

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

## GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OYUOUTFALL: B-1

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	20.0	8.07	9.2			28.1	20		

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28  
 Method 1700 Method 0950 Method 1700 Method 1020  
 Minutes 053 Amount LOG Amount LOG Amount LOG

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	Dilute to 100	NUMBER OF ORGANISMS	BS		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: <u>BS</u>								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 BS  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature BS WVR digi-thermo BS 7AS GC1 n/a  
 Chlorine Fischer & Porter 921A009U23 3811A940230-1 A  
 COMMENTS: \_\_\_\_\_



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 675

Sample ID: B-2

JRA ID: 97-3350

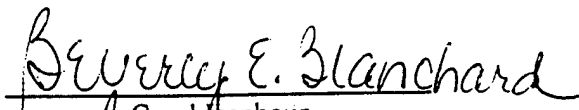
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
Carol Benhour  
for Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3350

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   3/26/97                      16:30

Test End:                      3/28/97                      16:13

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age:    1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.93 - 8.07</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3350 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3350 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3350

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:30</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.93 - 8.16</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3350 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>



JRA #: 97-3350 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

pwc # 675



Facility ODU  
Address Dept. Civil & Environ. Eng. ODU  
Norfolk, VA 23508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print&sign) Yang Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number B-2. 8Hr. Frequency of collection \_\_\_\_\_ Volume 2L

Temperature of sample in sample collection device 25.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_

Field pH 7.63 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description B-2. 8Hr.

Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon variegatus & Mysid shrimp  
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM  
Received by Lith Confel Date 3-26-97 Time 11:00 A.M.  
2. Relinquished by Lith Confel Date 3-26-97 Time 11:10 A.M.  
Received by Arthur D. Miller Date 3/26/97 Time 11:25  
See PWC C-00-

#675

FOR REED LAB USE ONLY

JRA# 97-3350 Arrival Temperature 2.4°C On ice? yes  
Color tan Odor earthy Solids none  
pH 7.78 DO (mg/L) 9.0 Conductivity (umhos/cm) 1900 @ 20.0 °C  
Salinity (ppt) 1 TRC (mg/L) - Method -



JRA# 97-3350

OBSERVATIONS

Acute *Cyprinodon variegatus* Toxicity Test

NPDES#: 11A CLIENT: Decma DOU OUTFALL: B-2  
ORGANISM SOURCE: ABS JRA BATCH#: C206 HATCH DATE: 3/22/97

Cubic % % Surv.	HOURS	REP #	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21 ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	8.44	8.25	8.28	6.6	7.7	8.2	20.5	19.5	19.7	20	20
100	B		10	10	10											
6.25	A		10	10	10	8.40	8.19	8.18	7.2	7.1	7.4	20.6	19.5	19.7	20	20
100	B		10	10	10											
12.5	A		10	10	10	8.35	8.25	8.27	7.3	7.4	7.4	20.6	19.5	19.7	20	20
100	B		10	10	10											
25	A		10	10	10	8.27	8.22	8.24	7.4	7.5	7.4	20.6	19.5	19.7	20	20
100	B		10	10	10											
50	A		10	10	10	8.14	8.16	8.21	8.0	7.5	7.4	20.4	19.5	19.7	20	20
100	B		10	10	10											
100	A		10	10	10	7.93	8.00	8.16	9.0	7.5	7.8	20.0	19.5	19.7	20	20
100	B		10	10	10											

INIT	983	985	983	
DATE 1997	3/26	3/27	3/28	
TIME	1635	1630	1630	

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



JRA# 97-3350

OBSERVATIONS

acute *Mysidopsis bahia* Toxicity Test

NPDES#: N/A CLIENT: Ocean ODW OUTFALL: B-2  
ORGANISM SOURCE: Chesapeake Cultures JRA BATCH#: M464 HATCH DATE: 3/25/97 1430 - 0800

Conc (%) % Surv.	HOURS	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 50%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	8.44	8.28	8.24	6.6	7.8	8.0	20.5	20.1	20.1	20	20
6.25	A		10	10	10	8.40	8.25	8.17	7.2	7.3	7.3	20.5	20.1	20.1	20	20
12.5	A		10	10	10	8.35	8.25	8.16	7.3	7.3	6.9	20.4	20.1	20.1	20	20
25	A		10	10	10	8.27	8.22	8.13	7.4	7.4	6.6	20.4	20.1	20.1	20	20
50	A		10	10	10	8.14	8.16	8.13	8.0	7.4	6.6	20.4	20.1	20.1	20	20
100	A		10	10	10	7.93	8.13	8.07	9.0	7.5	7.1	20.0	20.1	20.1	20	20

INIT	100	100	100
DATE 10/97	100	100	100
TIME	100	100	100

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" C. variegatus "

## GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: 8-2

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	20.0	7.93	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28  
 Method 1700 Method 1700 Method 1700 Time 1700  
 Minutes 100 Amount 100 Amount 100 Init 100

DILUENT 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	40.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	100		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: <u>PS3</u>								

TEST CHAMBER SIZE: 250ml TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200ml  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 226  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature 7AS GCL n/a  
 Chlorine Fischer & Porter 321A009U23 3811A940230-1 A  
 COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 674

Sample ID: B-3

JRA ID: 97-3349

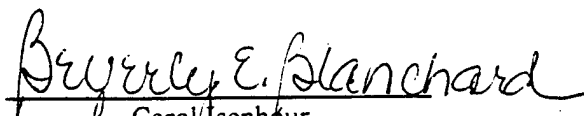
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3349

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.91 - 8.14</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3349 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 8.9</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3349 Test Type&Organism: Acute *Mysidopsis bahia*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3349

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/26/97                      Time 16:35

Test End:                      3/28/97                      16:37

Test Type (chronic/acute):    Acute

Test Organism:                Cyprinodon variegatus                Age: 4 days

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.91 - 8.17</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3349 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.8 - 8.9</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3349 Test Type&Organism: Acute Cyprinodon variegatus

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


## CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

PWC# 674



Facility ODU  
Address Dept. Civil & Environ. Eng. ODU  
Norfolk, VA 23508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print&sign) Yang Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number B-3. 8Hr Frequency of collection \_\_\_\_\_ Volume 2L  
Temperature of sample in sample collection device 25.0°C  
Final temperature of effluent at sample collection point \_\_\_\_\_  
Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_  
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)  
Is the sample chlorinated? No. dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_  
Permit with interim chlorine limit? No. If yes - limit (mg/L) \_\_\_\_\_  
Field pH 7.50 Field Total Residual Chlorine \_\_\_\_\_  
Comments/Sample description B-3. 8Hr.

Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon Variegatus & Mysid shrimp.  
Method of shipment Reel

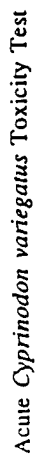
Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM  
Received by Keith Craft Date 3-26-97 Time 11:00 A.M.  
2. Relinquished by Keith Craft Date 3-26-97 Time 11:10 A.M.  
Received by Andrew Zivile Date 3/26/97 Time 1125

see PWC C.O.C

FOR REED LAB USE ONLY

JRA# 97-3349 Arrival Temperature 24°C On ice? yes  
Color TCN Odor earthy Solids None  
pH 7.74 DO (mg/L) 8.8 Conductivity (µmhos/cm) 1900 @ 21 °C  
Salinity (ppt) 1 TRC (mg/L) — Method —



## OBSERVATIONS

JRA# 97-3349

AlA

CLIENT: Ocean DM

OUTFALL:

NPDES#: 111A  
ORGANISM SOURCE: ABS

JRA BATCH#: C206

HATCH DATE: 3/22/87

[illegible]

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96





Acute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-3349

NPDES#: N/A CLIENT: Ocean OUTFALL: B-3  
ORGANISM SOURCE: Chesapeake Bay JRA BATCH#: M454 HATCH DATE: 3/25/97 V32-0807

Cone (%) % Surv.	HOURS →	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	0	A	10	10	10	8.44	8.28	8.24	6.6	7.8	8.0	24.5	24.1	24.1	20	20
6.25	0	A	10	10	10	8.39	8.27	8.18	7.1	7.4	7.3	26	24.1	24.1	20	20
100	0	B	10	10	10	8.31	8.25	8.15	7.3	7.4	6.9	26	24.1	24.1	20	20
12.5	0	A	10	10	10	8.23	8.23	8.16	7.5	7.5	6.8	25	24.1	24.1	20	20
100	0	B	10	10	10	8.14	8.15	8.12	8.0	7.5	6.6	24.1	24.1	24.1	20	20
50	0	A	10	10	10	7.91	8.04	8.14	8.9	7.7	7.3	24.1	24.1	24.1	20	20
100	0	B	10	10	10											
100	0	A	10	10	10											
100	0	B	10	10	10											
INIT			98	98	98											
DATE 1997			3/26	3/27	3/28											
TIME			1630	1722	1820											

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

## GENERAL COMMENTS

JRA# 97-3349

NPDES#: N/A CLIENT: Oceana OCUOUTFALL: B-3

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	20.1	7.91	/	8.9	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/24 Date 3/27 Date 3/27 Date 3/28  
 Method 1700 Method 0950 Method 1700 Method 1020  
 Minutes 053 Amount 106 Amount 106 Amount 106

DILUENT 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	10.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS	
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS	DSJ		DSJ	
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS				DSJ
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES				N/A
12.5	↓	↓	125	↓					
25	↓	↓	250	↓					
50	↓	↓	500	↓					
100	↓	↓	1000	0					
CALCULATIONS PERFORMED BY: DSJ									

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 220mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 053 226  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature 053 VWR digi-thermo 053 745 QCI n/a  
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A  
 COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 681

Sample ID: Feed S.

JRA ID: 97-3356

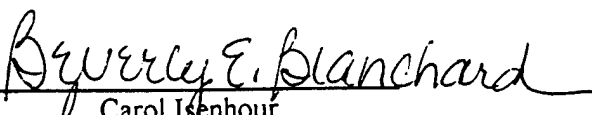
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
for Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3356

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   3/26/97                      16:30

Test End:                      3/28/97                      15:35

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age:    1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    All vessels from test initiation

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.30 - 7.89</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3356 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.2 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>Spearman-Karber</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3356 Test Type&Organism: Acute Mysisidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>33%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3356

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/26/97                      Time 16:35

Test End:                      3/28/97                      15:38

Test Type (chronic/acute):    Acute

Test Organism:                Cyprinodon variegatus                      Age: 4 days

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    All vessels from test initiation

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.30 - 7.86</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3356 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.1 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>Spearman-Karber</u>
Growth/Reproduction:	<u>N/A</u>



JRA #: 97-3356 Test Type&Organism: Acute *Cyprinodon variegatus*

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50		<u>34%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		
2/28/97	Invalid	35		
3/12/97	17.7	52		
3/20/97	19.5	35		
3/26/97	33	34		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

PWC# 681



Facility ODU  
Address Dept. Civil & Environ. Eng. ODU  
Norfolk, VA 23508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print&sign) \_\_\_\_\_ Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 1:00 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number Feed S. Frequency of collection \_\_\_\_\_ Volume 2 L.

Temperature of sample in sample collection device 26.0°C

Final temperature of effluent at sample collection point \_\_\_\_\_

Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_

Permit with interim chlorine limit? No. If yes - limit (mg/L) \_\_\_\_\_

Field pH 6.79 Field Total Residual Chlorine \_\_\_\_\_

Comments/Sample description Feed S.

Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon Variegatus & Mysid Shrimp  
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 1:00 PM  
Received by Keith C. Felt Date 3-26-97 Time 11:00 AM  
2. Relinquished by Keith C. Felt Date 3-26-97 Time 11:30  
Received by Arthur Miller Date 3/26/97 Time 11:25 #681  
See PWC C.O.C.

FOR REED LAB USE ONLY

JRA# 97-3356 Arrival Temperature 24°C On ice? yes  
Color tan Odor yeast Solids none  
pH 7.17 DO (mg/L) 9.0 Conductivity (µmhos/cm) 100 @ 19.1 °C  
Salinity (ppt) 1 TRC (mg/L) — Method —

# CHAIN-OF-CUSTODY RECORD

## & ANALYSIS REQUEST FORM



PWC ENVIRONMENTAL LABORATORY  
 CODE 930 BLDG Z-140  
 9742 MARYLAND AVENUE  
 NORFOLK, VA 23511 - 3095  
 PH: (757)445-8851 FAX: (757)445-8852

CONTINUATION SHEET  
 SHEET 2 OF 2

P.O.C.: Douglas Kirk  
 COMMAND: Oceana

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO											pH	TEMPERATURE	
000284	681	Feed. S	START	3/24/13	1300	G	Yang	L	1	1P	Bioassay	97-3356	97-3357	ASR
000285	685	DI Water	STOP	1300	1300	↓	↓	↓	↓	↓	↓	97-3357	97-3357	↓
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											
			START											
			STOP											

# CHAIN-OF-CUSTODY RECORD

## & ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852



### CLIENT INFORMATION

COMPANY/COMMAND: Oceanic CODE:   
 CONTACT: Douglas Kirk  
 PHONE: 433-2131 EXT:  FAX: 433-2719  
 J.O. #: 1912290  
 SIGNATURE: DD S. L. e  
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS			PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER	
674	B-3	START	3/5/10	2100	G	Yag	L	1	1P	Brossard	97-3349			as
675	B-2	STOP		2100							97-3350			
676	B-1	START		2100							97-3351			
677	A-3	STOP		2100							97-3352			
678	A-2	START		2100							97-3353			
679	A-1	STOP		2100							97-3354			
680	Mix L.P.R.	START		1300							97-3355			

TYPE	MATRIX	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	1 - COOL TO 4°C
CF - COMPOSITE FLOW	S - SOLID	G - GLASS	2 - HNO <sub>3</sub> PH=2
CT - COMPOSITE TIME	GS - GAS	T - TEFION	3 - H <sub>2</sub> SO <sub>4</sub> PH=2
	SS - SEMI-SOLID	V - VOAL	4 - NaOH PH=12
		H - HEXANERINSE	5 - HCL PH=2
			6 - 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 4°C
			7 - FIELD FILTER
			8 - NONE

TURNAROUND (DAYS): \_\_\_\_\_ (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS: \_\_\_\_\_

SAMPLE DISPOSAL: ( ) RETURN TO CLIENT ( ) DISPOSAL BY LAB

REGULATION APPLIED:  
 RCRA ( ) HRSD ( )  
 SDWA ( ) TSCA ( )  
 CWA ( ) PHOTO ( )  
 CAA ( ) OTHER ( )

SAMPLING/COLLECTION CHARGE: \$ \_\_\_\_\_

POSSIBLE SAMPLE HAZARDS: \_\_\_\_\_

COMMENTS: \_\_\_\_\_

D.O. NUMBER: \_\_\_\_\_

CONTRACT LAB: \_\_\_\_\_

CONTRACT NO. (S): \_\_\_\_\_

INITIAL: \_\_\_\_\_

DATE: \_\_\_\_\_

OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). \*  
 \*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY			
CHECK BOX CONTAINER TYPE			
HOLDING TIME ( )	CONTAINERS ( )	INITIAL	REASON
REINQUISHED BY: <u>Light Headed</u>	RECD BY: <u>DD S. L. e</u>	COMPANY/COMMAND: <u>Oceanic</u>	DATE/TIME: <u>3/24/10 12:30</u>
REINQUISHED BY: <u></u>	RECD BY: <u></u>	COMPANY/COMMAND: <u></u>	DATE/TIME: <u>3/24/10 12:30</u>
REINQUISHED BY: <u></u>	RECD BY: <u></u>	COMPANY/COMMAND: <u></u>	DATE/TIME: <u>3/24/10 12:30</u>
REINQUISHED BY: <u></u>	RECD BY: <u></u>	COMPANY/COMMAND: <u></u>	DATE/TIME: <u>3/24/10 12:30</u>



JRA# 97-356

OUTFALL: Feed 2

HATCH DATE: 3/22/97

(Indicate comments with an \* and document on General Comments page)

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

LC50 = 34%

DATE: 3/26/97  
 TOXICANT : Feed S.  
 SPECIES: C. variegatus

TEST NUMBER: 97-3356

DURATION: 48 hours

RAW DATA: Concentration --- ---- (%)	Number Exposed	Mortalities
.00	20	0
6.25	20	0
12.50	20	0
25.00	20	1
50.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 34.15  
 95% LOWER CONFIDENCE: 31.92  
 95% UPPER CONFIDENCE: 36.54

---



acute *Mysidopsis bahia* Toxicity Test

# OBSERVATIONS

JRA# 97-3354

NPDES#: N/A CLIENT: Ocean OUTFALL: Feed S  
ORGANISM SOURCE: Chesapeake Cultures JRA BATCH#: M454 HATCH DATE: 3/25/97 1430-0800

Conc. (%) % Surv.	REPS ↓	HOURS →		NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)				TEMPERATURE (19 - 21°C)				SALINITY (19 - 21ppt)	
0	A	0	24	48		0	24	48				0	24	48		0	END
12.5	A	10	10	10		8.44	8.28	8.24				25	21	21		20	20
25	A	10	10	10		8.34	8.10	8.19				25	21	21		20	20
50	A	10	10	10		8.26	8.23	8.23				24	21	21		20	20
100	A	10	10	10		8.14	8.10	8.32				24	21	21		20	20
100	A	10	10	10		7.88	7.97	8.53				22	21	21		20	20
100	A	10	10	10		7.30	7.89	-				19.1	20.1	-		20	20

INIT	100	406	106	
DATE 1997	726	727	726	
TIME	1630	1550	1535	

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



LC50 = 33%

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 3/26/97  
TOXICANT : Feed S.  
SPECIES: M. bahia

TEST NUMBER: 97-3356

DURATION: 48 hours

RAW DATA:	Concentration	Number	Mortalities
--- ----	(%)	Exposed	
	.00	20	0
	6.25	20	0
	12.50	20	1
	25.00	20	1
	50.00	20	20
	100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 32.99  
95% LOWER CONFIDENCE: 29.98  
95% UPPER CONFIDENCE: 36.29

---

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* " " "

## GENERAL COMMENTS

JRA# 97-3356

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: Feed

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 1300	3/26/97	19.1	7.30	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/26 Date 3/27 Date 3/27 Date 3/28  
 Method 1700 Method 0950 Method 1700 Method 1000  
 Minutes Amount Amount Init 183 106 106 106

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	22.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUTE (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Dilute + 1000	NUMBER OF ORGANISMS	183		
6.25			62.5		STATISTICAL ANALYSES	183		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: <u>183</u>								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>183</u> <u>VWR</u>	digit-thermo	<u>1046303</u> <u>745 QC1</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

all vessels aerated.



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 680

Sample ID: Mix L. R.R.

JRA ID: 97-3355

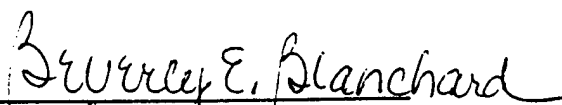
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
\_\_\_\_\_  
Carol Isenhour  
for Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3355

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:02</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.98 - 8.24</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3355 Test Type&Organism: Acute *Mysidopsis bahia*

**RANGE OF CHEMICAL PARAMETERS (Continued)**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.9</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3355 Test Type&Organism: Acute *Mysidopsis bahia*

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3355

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:15</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.98 - 8.24</u>	<u>8.28 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3355 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.9</u>	<u>6.6 - 8.2</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>



JRA #: 97-3355 Test Type&Organism: Acute (Cyprinodon variegatus)

**TEST RESULTS** (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Growth or Reproduction (NOEC)            (LOEC)             
Normal Distribution (yes/no)             
Homogeneous Variance (yes/no)           

Reference Toxicant Test Date 3/31/97  
Result (mg/L) >40  
QC Range (mg/L) 2 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mix L. R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

pwc # 680



Facility ODU  
Address Dept. Civil & Environ. Eng. ODU  
Norfolk, VA - 23508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print & sign) Yang Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 1:00 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number Mix L RR Frequency of collection \_\_\_\_\_ Volume 2L  
Temperature of sample in sample collection device 24.0°C  
Final temperature of effluent at sample collection point \_\_\_\_\_  
Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_  
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)  
Is the sample chlorinated? No dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_  
Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_  
Field pH 7.46 Field Total Residual Chlorine \_\_\_\_\_  
Comments/Sample description Mix L RR

Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon Variegatus & Mysid shrimp  
Method of shipment cool

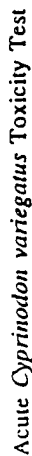
Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 1:00 PM  
Received by Kathy Cuffel Date 3-26-97 Time 11:00  
2. Relinquished by Kathy Cuffel Date 3-26-97 Time 11:10  
Received by Debbie Mueller Date 3/26/97 Time 11:25  
See PWC 6-0-0

#680

FOR REED LAB USE ONLY

JRA# 97-3355 Arrival Temperature 8.4°C On ice? yes  
Color tan Odor earthy Solids none  
pH 7.80 DO (mg/L) 8.9 Conductivity (umhos/cm) 1800 @ 19.1 °C  
Salinity (ppt) 1 TRC (mg/L) — Method —



## OBSERVATIONS

JRA# 97-355

NPDES#: 11A

 $\vdash A$ 

CLIENT: Ocean

2108

8004 IRA BATCH#: C20C

OUTFALL: MIX L.  
DATE: 3/22/97

OUTFALL: M, XL.  
HATCH DATE: 3/22/97

NPDES#: 111A  
ORGANISM SOURCE: ABS

Conc. % % Surv.	HOURS⇒	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)		
			0	24	48	0	24	48	0	24	48	0	24	48	0	END	
0	A		10	10	10	8.41	8.25	8.24	7.7	8.2	24	48	25	19.5	19.7	20	20
100	B		10	10	10	8.40	8.25	8.28	7.2	7.5	7.2	8.2	25	19.5	19.7	20	20
6.25	A		10	10	10	8.38	8.25	8.29	7.3	7.7	8.2	8.2	25	19.5	19.7	20	20
100	B		10	10	10	8.27	8.24	8.30	7.5	7.6	8.2	8.2	24	19.5	19.7	20	20
12.5	A		10	10	10	8.19	8.20	8.24	8.0	7.6	8.2	8.2	20	19.5	19.7	20	20
100	B		10	10	10	7.98	8.09	8.24	8.9	7.5	8.0	8.0	19.1	19.5	19.7	20	20
25	A		10	10	10												
100	B		10	10	10												
50	A		10	10	10												
100	B		10	10	10												
100	A		10	10	10												
100	B		10	10	10												

INIT	DATE 1997	TIME
053	3/26	1602
053	3/27	1602
	3/28	1645

(Indicate comments with an \* and document on General Comments page)

Rev 3/19/96



acute *Mysidopsis bahia* Toxicity Test

# OBSERVATIONS

JIRA# 97-3555

IPDES#: N/A CLIENT: Ocean OUTFALL: MIX L  
ORGANISM SOURCE: Chesapeake Cultures JIRA BATCH#: M454 HATCH DATE: 3/25-26/97 1430-0800

Conc (%)	REP	HOURS	NUMBER OF LIVE ORGANISMS (Control $\geq$ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) ( $>4.0$ , $<9.1$ @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	0	24	0	24	0	24	48	0	END
0	A	0	10	24	8.44	8.28	6.6	7.8	20.5	20.1	20.1	20	20
100	B	0	10	10	8.40	8.25	7.2	7.7	20.5	20.1	20.1	20	20
6.25	A	0	10	10	8.38	8.26	7.3	7.7	20.5	20.1	20.1	20	20
100	B	0	10	10	8.27	8.24	7.5	7.7	20.1	20.1	20.1	20	20
12.5	A	0	10	10	8.19	8.20	8.0	7.8	20.0	20.1	20.1	20	20
90	B	0	10	10	7.98	8.10	8.9	7.6	19.1	20.1	20.1	20	20
25	A	0	10	10									
100	B	0	10	10									
50	A	0	10	10									
100	B	0	10	10									
100	A	0	10	10									
100	B	0	10	10									

INIT	053	083	093
DATE	3/26	3/27	3/28
TIME	1630	1636	1602

(Indicate comments with an \* and document on General Comments page)

" C. variegatus "

## GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: Mix L

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L) >4;<9.1	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt) 19-21	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 1300	3/26/97	19.1	7.98		8.9		1	20		

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28  
 Method 1700 Method 0950 Method 1700 Method 1020  
 Minutes Amount Amount Init 153 LOG LOG LOG

DILUENT ( 20ppt Forty Fathoms ) 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	205	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			153
Control	1000	100	0	Diluent 1000	NUMBER OF ORGANISMS	153		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: 153								

TEST CHAMBER SIZE: 250ml TYPE: Polystyrene VOLUME OF TEST SOLUTION: 220ml

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	745 QCI	N/A
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

April 3, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 685

Sample ID: DI Water

JRA ID: 97-3357

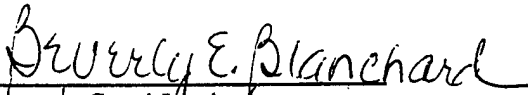
Performed for:

Merrill Anderson-Ashcraft  
**Navy Public Works Center**  
9742 Maryland Avenue  
Code 930, Bldg. Z-140  
Norfolk, VA 23511

Performed by:

James R. Reed & Associates  
11864 Canon Blvd., Suite 103  
Newport News, VA 23606

Respectfully,

  
\_\_\_\_\_  
Carol Isenhour  
Vice President

JRA/jsc

**TEST SUMMARY SHEET**  
**(For Marine and Freshwater Tests)**

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: DI Water JRA #: 97-3357

Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date                      Time  
   3/26/97                      16:30

Test End:                      3/28/97                      16:35

Test Type (chronic/acute):    Acute

Test Organism:                Mysidopsis bahia                      Age:    1 day

Test Chamber Size:        250 mL

Volume of Test Solution per Chamber:        200 mL

Diluent:    20 ppt Forty Fathoms

Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u>&lt;0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.31 - 8.37</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	



JRA #: 97-3357 Test Type&Organism: Acute Mysidopsis bahia Screen

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.0</u>	<u>6.6 - 8.0</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test Known Parentage? <u>N/A</u>	<u>N/A</u>
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3357 Test Type&Organism: Acute Mysidopsis bahia

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEST SUMMARY SHEET**  
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A  
Outfall/Receiving Stream: DI Water JRA #: 97-3357  
Test Period for Which Data is Being Submitted: \_\_\_\_\_  
(i.e., first quarter, semiannual, or annual)

**SUMMARY OF TEST CONDITIONS**

Test Start:                      Date 3/26/97                      Time 16:35  
Test End:                      3/28/97                      16:35  
Test Type (chronic/acute):    Acute  
Test Organism:                Cyprinodon variegatus                      Age: 4 days  
Test Chamber Size:        250 mL  
Volume of Test Solution per Chamber:    200 mL  
Diluent:    20 ppt Forty Fathoms  
Aeration Period (if necessary):    None

**RANGE OF CHEMICAL PARAMETERS**

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u>&lt;0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.29 - 8.37</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3357 Test Type&Organism: Acute *Cyprinodon variegatus*

**RANGE OF CHEMICAL PARAMETERS (Continued):**

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO<sub>3</sub>)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

**TEST RESULTS**

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control ( <i>C. dubia</i> )	<u>N/A</u>
60% of Control Females ( <i>C. dubia</i> ) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs ( <i>M. bahia</i> )	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3357 Test Type&Organism: Acute Cyprinodon variegatus

**TEST RESULTS (Continued)**

3. Statistical Results (as appropriate)

LC50		<u>&gt;100%</u>	
Survival	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Growth or Reproduction	(NOEC)	<u>          </u>	(LOEC) <u>          </u>
	Normal Distribution (yes/no)	<u>          </u>	
	Homogeneous Variance (yes/no)	<u>          </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>&gt;40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments


# CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

DI Water

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody  
(Please complete all information)

PWC # 482  
695



Facility ODU  
Address Dept. Civil & Environ. Eng. ODU  
Norfolk, VA 23508  
County \_\_\_\_\_ Pipe/Outfall/Location \_\_\_\_\_  
NPDES# \_\_\_\_\_ Instream Waste Conc \_\_\_\_\_  
Sample collected by (print & sign) Yang Affiliation \_\_\_\_\_  
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM  
\_\_\_\_\_ (Composite): From Date \_\_\_\_\_ Time \_\_\_\_\_  
To Date \_\_\_\_\_ Time \_\_\_\_\_

Subsamples comprising composite:

Number DI water Frequency of collection \_\_\_\_\_ Volume 2 L  
Temperature of sample in sample collection device 25.0°C  
Final temperature of effluent at sample collection point \_\_\_\_\_  
Is sample collection device chilled? \_\_\_\_\_ Is sample packed on ice for shipment? \_\_\_\_\_  
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)  
Is the sample chlorinated? No dechlorinated? \_\_\_\_\_ If so, how? \_\_\_\_\_  
Permit with interim chlorine limit? No If yes - limit (mg/L) \_\_\_\_\_  
Field pH 5.46 Field Total Residual Chlorine \_\_\_\_\_  
Comments/Sample description DI water

Type of test(s) to be performed Acute Toxicity Testing  
(Specify organisms) Cyprinodon Variegatus & Mysid Shrimp  
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM  
Received by Keith C. F. Date 3-26-97 Time 11:00 A.M.  
2. Relinquished by Keith C. F. Date 3-26-97 Time 11:10 A.M.  
Received by Recher Miller Date 3/26/97 Time 11:52 # 625  
see PWC COC

FOR REED LAB USE ONLY

JRA# 97-3357 Arrival Temperature 2.4°C On ice? yes  
Color clear Odor none Solids none  
pH 5.08 DO (mg/L) 9.0 Conductivity (µmhos/cm) <10 @ 19.4°C  
Salinity (ppt) <1 TRC (mg/L) — Method \_\_\_\_\_

NPDES#: VLA

CLIENT: Ocean, OM

OUTFALL: DI W370

ORGANISM SOURCE: ABS

JRA BATCH#: C200

HATCH DATE: 3/22/97

[illegible]





NPDES# N/A

CLIENT: Debra Dunn

OUTFALL; DI water

ORGANISM SOURCE: crossed culture

JRA BATCH#: MYSY

HATCH DATE: 3/25-26/97 1430-0800

[illegible]


 NPDES#: N/A CLIENT: EECAR ODU OUTFALL: DI WATER

## SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	19.4	8.37	/	9.0	/	<1	20	/	/

 DO Adj. pH Adj. TRC Adj. Feedings Mysid

Date 1997 Date 3/26 Date 3/27 Date 3/27 Date 3/28 Date 3/29 Date 3/29 Date 3/30  
 Method 1700 Method 0950 Method 1700 Method 1020 Method 1 Method 1 Method 1  
 Minutes 150 Amount 106 Amount 106 Amount 106 Amount 106 Amount 106 Amount 106

 DILUENT ( 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other \_\_\_\_\_ ) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

## TREATMENT PREPARATIONS CALCULATIONS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
100	1000	100	—	1000	TREATMENT PREPARATION CALCULATIONS	DB		DB
100	1000	100	1000	—	NUMBER OF ORGANISMS	DB		
					STATISTICAL ANALYSES	N/A		
CALCULATIONS PERFORMED BY: <u>DB</u>								

TEST CHAMBER SIZE: 250mL TYPE: physiologic VOLUME OF TEST SOLUTION: 200mL  
 EQUIPMENT Make Model Serial Number Probe Number  
 pH meter Corning 245 5147 26  
 DO meter YSI 54ARC 14522 N  
 SCT meter YSI 33 4458 A  
 Temperature WVR diui-thermo 7AS QCI n/a  
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A  
 COMMENTS: